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## **BMJ Open**

## Acceptance of COVID-19 vaccines among Palestinians: Who is willing to be vaccinated?

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#### Acceptance of COVID-19 vaccines among Palestinians: Who is willing to be vaccinated?

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#### Abstract

Introduction: In Palestine (West Bank and Gaza), there have been more than 320,890 known cases of COVID-19, resulting in 3452 deaths. The detrimental effects of the virus can be seen in the nation's health, economy, and government operations, leading to radical uncertainty that is exacerbated by the absence of any definitive treatment or vaccines. The level of knowledge about and trust in treatment and vaccination varies worldwide. This study aims to assess the willingness of Palestinians to receive a COVID-19 vaccine and their knowledge about such vaccines.

**Methods**: An online survey of adults over 18 years old (n = 1080) was conducted in Palestine in October 2020. Using multivariate logistic regression, we identified correlates of participants' willingness to get a COVID-19 vaccine.

**Results:** We found that about 63% of participants were willing to get a COVID-19 vaccine. However, acceptance varied with the specific demographic variables that were investigated. Females (OR = 1.00), married participants (OR = 4.48), and those 18-24 years (OR = 1.00) are more likely to take the vaccine. Further, participants with good knowledge about the vaccine and its side effects are more willing to get the vaccine.

Conclusion: The availability of a safe and effective COVID-19 vaccine in Palestine is crucial to decrease the burden of COVID-19 morbidity and mortality. In addition, to ensure a high vaccination rate, health awareness campaigns should target those who are not willing to get the vaccine, especially those who are more vulnerable and the elderly.

#### Strengths and limitations

- This study is the first to estimate the willingness of people to receive a COVID-19 vaccine in Palestine
- About 63% of the study population showed a positive attitude toward vaccination against COVID-19
- The study found that willingness was affected by gender, age, and marital status
- COVID-19 vaccines amount in Palestine is low, and the findings reinforce that a safe and
  effective COVID-19 vaccine availability in Palestine is crucial to decrease the burden of
  COVID-19
- There is a lot of gossip about vaccines side effects, so it is crucial to monitor the change in population's intentions to receive a vaccine because it might affect the vaccine uptake

#### Introduction

The novel coronavirus (COVID-19) was first detected in Wuhan in 2019, signaling the start of a severe global pandemic. Since then, COVID-19 has infected over 107,532,472 people and caused 2,354,212 deaths worldwide. As of April 2021, COVID-19 has infected 317,961 Palestinians and caused 3406 deaths. This has resulted in serious consequences for world health and the global economy and forced governments to operate in a context of radical uncertainty, as there were previously no definitive treatments or vaccines. Consequently, many countries have acknowledged these tremendous problems and are cooperating to improve the situation. Vaccines for COVID-19 are an important health measure to help bring the pandemic under control, and several promising vaccines have already been approved and are considered safe and effective. Several countries have started the process of vaccinating their populations using Pfizer/BioNTech, Moderna, Sputnik V, Sinopharm, and Oxford-Astra Zeneca vaccines. Since the virus poses a significant threat to public health, vaccination is an essential intervention; however, public perception toward the uptake of COVID-19 vaccines has not yet been determined.

Determann and colleagues found that disease and vaccination programs influence respondents' receptiveness to vaccines during a pandemic, which affects vaccine uptake. Previous studies have shown that the general population's intention to accept or decline a vaccine is influenced by their perception of personal risk, attitude toward vaccination, and ethnicity. Kourlaba and colleagues reported that the acceptance rate for vaccination was 57·7% in Greece, while a behavioral model developed by Schwarzinger and colleagues predicted that 29·4% (95% CI: 28·6–30·2) of the French population of working age would refuse the COVID-19 vaccine.

The medical services in Palestine are fragmented and are provided by the Palestinian Ministry of Health (PMOH), non-governmental health institutions, military medical services, United Nations Relief and Works Agency (UNRWA), and the private sector. The number of medical cadres registered in various medical associations in Palestine has reached 31,873, of which 24,432 (76.6%) are in the West Bank and 7441 (23.3%) are in the Gaza Strip. Thus, after one year of battling with COVID-19, the health care system in Palestine is facing a crisis due to the spread and increase in infection rate of COVID-19. Hospitals, which are already operating beyond their capacity, are being overloaded by new cases of COVID-19. Health providers are being faced with extraordinary levels of demand, as hospital beds are now essentially filled by COVID-19 cases and the number of infections is increasing. To decrease the incidence of COVID-19, lower the demand for intensive care, and reverse the course of the COVID-19 epidemic, a large portion of the population must be vaccinated within a short period. In the absence of prophylaxis through a vaccine, the surge in cases will likely continue.

Saied and colleagues observed that acceleration in the rate of vaccine development compared to the past has aroused speculation about whether or not such vaccines are safe to use. <sup>12</sup>Furthermore, they noted that the side effects of the new COVID-19 vaccinations are still unknown, and people on social media are providing misleading information about the new vaccines. Consequently, WHO has administered a serious warning that this epidemic could turn into an "infodemic". This refers to a

phenomenon that occurs when people start spreading debunked news and false information based on anecdotal evidence. <sup>13</sup>Qattan and colleagues state that in order to successfully implement a vaccination program, people need to accept the vaccine; this requires that the government build more public trust in emergency-released vaccines. <sup>14</sup>

Effective control of the COVID-19 pandemic via widespread vaccination will require achieving sufficient herd immunity among the population; for COVID-19, this requires a vaccination rate of about 67%. However, information is currently lacking about people's acceptance of COVID-19 vaccines and the factors that may influence their acceptance. The availability of such information will be beneficial for planning future campaigns to improve vaccine uptake. Hornefore, this study aims to assess the willingness of the general public to get a COVID-19 vaccine in Palestine (West Bank and Gaza).

#### Methods

We conducted a cross-sectional web-based study to assess the willingness of the Palestinian population to receive a COVID-19 vaccine. Participation was limited to those who were 18 years or older and residing in Palestine. Data was gathered anonymously online through a self-administered questionnaire designed using Google Forms. Participants (n =1080) were informed that participation was voluntary and confidential, can stop completing the survey at any time. This study obtained ethical approval by the Institutional Review Board at Bethlehem University.

#### **Data collection**

The survey items were developed based on information about the COVID-19 pandemic provided by the World Health Organization (WHO).<sup>17</sup>The survey questionnaire consisted of several sections: demographic information; health status; and knowledge about the nature of the COVID-19 virus,

treatment and prevention modalities. In addition, the survey collected information about priority groups that should be vaccinated and participants' willingness to be vaccinated.

Demographic data included questions about gender, age, geographical region, locality (city, village, or camp), marital status, educational level, employment status, income, smoking status, and disease status. We then assessed items that might affect participants' willingness to be vaccinated, their knowledge regarding modalities of treatment and prevention of COVID-19 and if such knowledge affected their willingness to be vaccinated. We asked participants whether certain medications would be of benefit to treat or prevent COVID-19 infection. Furthermore, participants were asked about the role of plasma from recovered COVID-19 patients in treating the infection. We also asked whether the vaccine would be safe or not once it is available and whether the vaccine would provide immunity against COVID-19 instead of transmitting the infection.

We also assessed the participants' knowledge of which priority groups should be vaccinated, and acceptance of COVID-19 vaccination was assessed by asking them about their willingness to get the vaccine once it becomes available in Palestine. In addition, trust in the vaccination process was evaluated by asking them if they would accept having their children vaccinated and if they trusted the scientists involved in COVID-19 vaccine development.

Knowledge and attitude scores were calculated by adding up the number of correct answers (i.e., the first answer option) for each question. Each variable was given equal weight, and each score was recoded into three equal groups.

#### 2.3. Statistical analysis

Analysis of the data was completed using IBM SPSS version 26.0. Descriptive measures are presented as percentages. Pearson's chi-square was used for the comparison of categorical variables. Bivariate analysis was conducted to measure the correlation between participants' willingness to get a COVID-6

19 vaccine and other independent variables. Multiple logistic regressions were also performed to identify the variables associated with vaccine acceptance among Palestinians. Results were considered significant when the p-value was less than 0·050. Confidence intervals and odds ratios (ORs) were also determined.

#### **Patient and Public Involvement**

No patients were involved in this study.

#### Results

# Participant characteristics

Of the 1080 participants, half were young adults between the ages of 25 and 44 (49·9%) and more than half were female (58·6%). The majority of participants came from the south of West Bank (46·8%) and lived in the city (59·7%). Just over half of the participants were married (53·2%) and the vast majority had bachelor's degrees (66·0%). About 41·1% of the participants were healthcare workers. Sixty-six and a half percent of participants never smoked, and only 18·3% of participants had at least one medical disease. Less than half of the participants had been tested for COVID-19 (40·9%). Only 14·1% reported a personal history of COVID-19 infection, while 94.9% reported a history of COVID-19 infection among family members (Table1).

Insert Table1 here

#### Willingness to get a COVID-19 vaccine

Around 63% of participants were willing to get a COVID-19 vaccine (Table2). Based on participants' knowledge about the nature of the COVID-19 virus, participants who were willing to be vaccinated were those who considered COVID-19 to be a real virus (69%), compared to those who believed it was fabricated (39%) and those who did not know what COVID-19 was (39%, p <0.0001). Participants

who thought they were susceptible to COVID-19 infection were willing to take the vaccine (65%), compared to those who did not (48%). Participants those who did not know if they were susceptible (41%, p < 0.050), or if they thought that following safety measures (wearing mask and keeping physical distance), compared to those who did not believe in such measures and those who did not know (face masks: 66%, 39%, 31%, p < 0.0001; distancing: 65%, 45%, 47%, p < 0.050) (Supplement file Table 1).

#### Insert Table2 here

The bivariate analysis measuring participants' willingness to be vaccinated against COVID-19 and their knowledge about the treatment and prevention of COVID-19 infection showed that those who were willing to get the vaccine were those who thought that it would be safe (91%), compared to those who did not think it would be safe (28%), and those who did not know (66%, p < 0.0001). Participants were also more willing to get the vaccine if they thought that the vaccine would not cause side effects (79%), compared to those who thought that it would (55%), and those who did not know (72%, p < 0.0001); if they thought that the vaccine should be given every year (74%), compared to those who thought it should not (53%), and those who did not know (60%, p < 0.0001); and if they believed that the COVID-19 vaccine would not transmit the infection instead of providing immunity (79%), compared to those who believed that it would (38%), and those who did not know (52%, p < 0.0001). Moreover, those who did not think that vitamins (such as vitamin C) and plasma from recovered COVID-19 patients would be of benefit for preventing infection were more willing to get the vaccine compared to those who answered "yes" or "don't know" (vitamins: 73%, 57%, 66%, p < 0.0001; plasma: 68%, 66%, 58%, p < 0.050). Participants' knowledge about the utility of antiviral or antimalarial medications to treat the infection, and giving the vaccine separately from other vaccines, did not significantly affect their willingness to receive the vaccine (Supplement file Table2).

Participants were in favor of distributing vaccines to all age groups, as well as pregnant women and the immunocompromised (Supplement file Table3). Participants' attitudes toward getting a COVID-19 vaccine (Table 3) were also assessed based on their trust in vaccination. Participants who were willing to receive the vaccine were those who agreed to give their children the vaccine (94%, p < 0.0001), trusted scientists and researchers (88%, p < 0.0001), thought that the period in which the vaccine was developed was sufficient (80%, p < 0.0001), and thought that information regarding vaccine development should be clear and accessible (74%, p < 0.0001), compared with those who disagreed or did not know (Supplement file Table4).

Insert Table3 here

In the multivariate logistic regression (Table4), participants were more likely to be willing to receive a COVID-19 vaccine if they were married (OR =  $4\cdot48$ , CL:  $1\cdot668-12\cdot044$ ), living in a camp (OR =  $2\cdot36$ , CL:  $0\cdot701-7\cdot945$ ), or living in Gaza (OR =  $7\cdot13$ , CL:  $1\cdot679-30\cdot303$ ). Participants who had high positive attitude scores toward vaccination would be more likely to accept the vaccine (OR =  $110\cdot62$ , CL:  $28\cdot329-431\cdot0$ ), along with those who had moderate knowledge scores regarding which priority groups should be vaccinated (OR =  $1\cdot60$ , CL:  $0\cdot768-3\cdot318$ ), and those who had high trust scores for vaccination were also more willing to get the COVID-19 vaccine (OR =  $11\cdot80$ , CL:  $4\cdot092-34\cdot006$ ). Participants were less likely to be willing to get a COVID-19 vaccine if they were male (OR =  $0\cdot86$ , CL:  $0\cdot425-1\cdot754$ ), ages 45 and older (OR =  $0\cdot11$ , CL:  $0\cdot024-0\cdot472$ ), had a bachelor's degree (OR =  $0\cdot65$ , CL:  $0\cdot124-1\cdot629$ ), or were non-healthcare professionals (OR =  $0\cdot85$ , CL:  $0\cdot412-1\cdot767$ ), and participants who had a high knowledge score regarding the nature of the COVID-19 virus (OR =  $0\cdot18$ , CL:  $0\cdot065-0\cdot492$ ) and who had a moderate score toward the treatment and prevention of COVID-19 infection (OR =  $0\cdot74$ , CL:  $0\cdot332-1\cdot629$ ).

Insert Table4 here

#### Discussion

The aim of this study was to evaluate the acceptance of COVID-19 vaccines among Palestinians.

Around 63% of the study population showed a positive attitude toward vaccination against COVID-19.

Our results were consistent with similar studies exploring the willingness of the population to be inoculated with the COVID-19 vaccine in Saudi Arabia (64·7%), China (72·5%), and the USA (80%). 18 As vaccines become available, it will be necessary to monitor changes in people's willingness and how that will affect vaccine uptake, since people's intentions do not always reflect their actual behavior. 16 Having a better understanding of the factors influencing people's decisions to accept an emergency-released vaccine can help authorities to better manage the pandemic. 19

Many studies have shown that willingness to receive a vaccine is linked to several factors, including the risk of being infected with the virus; the severity of the virus; the safety, efficacy, and adverse outcomes of the vaccine; a lack of knowledge about the nature of vaccine-preventable diseases; and misconceptions and misinformation related to the vaccine. 18,19

This study has highlighted several factors that may increase or decrease people's willingness to receive the vaccine. Perceived risk of becoming infected was a positive predictor of the intention to be vaccinated. 18,19 Our results were consistent with those of previous studies and showed that 65% of participants believed that they could be susceptible to COVID-19 infection.

Although wearing a mask correctly and keeping a safe social distance are crucial for reducing the spread of COVID-19, the CDC has stated that these measures alone will not be sufficient to stop the spread of the virus. Thus, using COVID-19 vaccines in combination with these measures will be vital for stopping the pandemic. <sup>20</sup>As reported in our study, participants who understood the importance of the aforementioned measures were more willing to get the vaccine. Therefore, governments and health agencies should do more to try and increase public awareness of the effectiveness of these measures.

According to the CDC, none of the existing COVID-19 vaccines will cause people to become infected with COVID-19. Furthermore, they confirmed that all the vaccines have been carefully assessed through clinical trials. COVID-19 vaccines have also been shown to decrease the seriousness of infection even if a person does becomeinfected.<sup>20</sup>This supports our finding where the majority of participants shared the same belief regarding the safety and effectiveness of the vaccine. Some participants who were reluctant to get the vaccine were worried about the side effects of the novel vaccine and its impact on their overall health. However, the majority of our study participants believed that the vaccine would not cause any serious side effects.

WHO has stated that every human being anywhere in the world who could benefit from a safe and effective COVID-19 vaccine should quickly have access to one. <sup>21</sup>Some of Palestine's neighboring countries such as Jordan and Egypt have started their vaccination campaigns, <sup>22</sup>and Palestinians also have the right to have fair and equal access to necessary health care, including COVID-19 vaccines, to face the burden of the pandemic, especially that physical implications such as path of the wall that has taken through West Bank and long-lived siege in Gaza that resulted in isolation from health care and making the vulnerable people in the society inaccessible to health services. <sup>9</sup>However, according to a correspondence published in The Lancet, the UN has stated that majority of Palestinians are unlikely to have access to the available vaccines in the near future. <sup>23</sup>

As of March 2021, the limited vaccines that were available to Palestinians were used to cover the first phase of vaccination according to the priorities suggested by a study conducted in China; this includes maintaining necessary services such as healthcare and national security. The second stage will then aim to reduce the number of severe cases, thereby decreasing the number of hospitalizations, admissions to intensive care units, and deaths. As a third stage, vaccination could be extended to the general population to decrease and ultimately stop the burden of viral transmission and symptomatic infections.<sup>24</sup>

According to Yang and colleagues,<sup>24</sup>the groups that should be prioritized to receive the COVID-19 vaccine are essential workers, which include healthcare providers as a top priority (according to the Palestinian Central Bureau of Statistics, the number of healthcare providers in Palestine in 2019 was 45,379 workers, including nurses, MDs, dentists, and pharmacists); high-risk individuals who may experience severe or fatal outcomes; and those who contribute to viral transmission, especially those who work to maintain daily activities such as transportation, food services, law enforcement, and civil services.

Furthermore, the health care system in Palestine remains submissive to Israel, with the Israeli state holding ultimate authority over healthcare budgets, border crossings, building permits, and pharmaceutical imports and exports. Consequently, MOH hospitals are basic in comparison to hospitals within Israel and lack many resources, especially specialist personnel, while the doctors practicing in the West Bank have limited opportunities for training and continued professional development due to imposed permit sanctions. Vaccine availability is therefore much lower in Palestine than in Israel. Building a plan to improve acceptance among those who are less willing to receive the vaccine, as identified by the study results, will be crucial. Therefore, frontline healthcare providers should be aware of data regarding the safety of the vaccines and advise people to get the vaccine based on solid scientific evidence, as their recommendation is known to be a driving factor that could positively affect the people's vaccination intentions. Lessons learned from previous pandemics such as SARS and MERS suggest that trusted information and guidance from professionals are crucial to control the spread of disease.

Our study has shown that higher trust scores were linked to a greater interest in being vaccinated. According to the PMOH annual health report from 2018, 99.8% of children were given the diphtheria tetanus (DT) and oral polio vaccine (OPV) vaccines in the first grade, and 99.5% of children got the dT vaccine in the ninth grade. <sup>10</sup>This shows that Palestinians have an appreciation for and believe in the

ability of vaccines to control diseases. In comparison, a cohort study conducted in the US found that more than 10% of parents reported delaying or refusing vaccinations for their children. <sup>26</sup>Although UK and European populations showed positive attitudes toward vaccination, about 10% still showed distrust in or were unwilling to get vaccines. <sup>27</sup>

Trust in vaccines is strongly associated with compliance with vaccine uptake. Until the sufficient supply of COVID-19 vaccine is available, addressing vaccine hesitancy and building confidence among the population will be vital. This will require direct and clear communication from government officials to provide information about how the vaccine works and its development. Vaccination programs must address public concerns about the level of vaccine effectiveness and the time needed for protection. The promotion of vaccination programs should be adopted and encouraged by the leaders of municipalities, religious societies, and non-governmental organizations, as well as those in the private sector. <sup>28</sup>Turst in the type of the vaccine offered is very important. The scientific debate on which is most effect vaccine with least side effects might influence people's willingness to get the vaccine. The influence of the type of vaccine on people's acceptance was not studied in our study, but we are documenting a current observation of people avoiding certain type of vaccine because of its side effects. Further research is needed to have a better understanding of people's choices and decisions.

We could not find any recent studies that investigated the "predictors of vaccine attitudes of Palestinians" and how such attitudes are associated with individuals who are not willing to receive the COVID-19 vaccine, except for one study by Salameh that investigated university students' knowledge of and attitude toward COVID-19 and only assessed if they would get the vaccine when it is available.<sup>29</sup>

The results of our study will help the government, policymakers, and healthcare professionals to effectively provide informative data during vaccination programs. However, further research is needed

to investigate those who are uncertain or less willing to get the vaccine, since they are considered as a target group for interventions to increase confidence in vaccination.

Our study is the first to estimate the willingness of people to receive a COVID-19 vaccine in Palestine and reflects the positive attitude of Palestinians toward receiving the vaccine, so it can be used as a guide for future vaccine uptake. Immunization with a safe and effective COVID-19 vaccine is an important strategy to reduce COVID-19-related morbidity and mortality and to help restore societal functioning. Although vaccines are currently in short supply, the ministry is conveying to the population that the vaccine is on its way. Thus, it is important that the population get the vaccine.

Furthermore, to manage those who do not wish to be inoculated, public health authorities need to consider people's concerns about novel vaccines, such as "personal risk perception and vaccination attitude," and address these concerns through awareness campaigns that aim to educate the public about the vaccine's safety and how it will help mitigate public health risks. 18

The higher the vaccine acceptance rate, the easier it will be for governments to quickly contain the spread of COVID-19 and better implement health management plans. It will be the responsibility of health agencies to build trust in the COVID-19 vaccine within communities.<sup>30</sup>

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None

#### **Conflict of interests**

The authors declare no competing interests

#### **Contributors**

Study design by HJZ. Data collection completed by HJZ, HS, SSM, RA, AS, NAR. Data analysis and results interpretation were done by NAR and HJZ. Writing the original draft was by HJZ, HS and revised by HJZ, HS, SSM, and NAR. All authors read and approved the final manuscript.

#### Availability of data and materials

Data and material are available on reasonable request

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**Table 1 Participant Characteristics (n = 1080)** 

Characteristic	n (%
Gender	
Female	633 (58.6
Male	447 (41.4
Age groups (years)	
18 – 24	368 (34.1
25 - 34	311 (28.8
35 – 44	228 (21.1
> 45	173 (16.0
Geographical region	173 (10.0
Middle of West Bank	295 (27.3
North of West Bank	147 (13.6
South of West Bank	535 (46.8
Gaza Strip	103 (9.5
Locality	100 (5.0
City	645 (59.7
Village	357 (33.1
Camp	78 (7.2
Marital Status	
Married	575 (53.2
Not married	505 (46.8
Educational level	
Diploma or less	114 (10.6
Bachelor	713 (66.0
Higher education	253 (23.4
Employment status	
Health professionals	444 (41.1
Non health professionals	636 (58.9
Income	
Excellent	84 (7.8
Very good	325 (30.1
Good	496 (45.9
Less than good Bad	99 (9.2 43 (4.0
Very bad	33 (3.1
Smoking status	33 (3.1
Cigarette only	158 (14.6
Shisha only	140 (13.0
Cigarette and shisha	29 (2.7
Electronic cigarette	9 (0.8
Ex-smoker	26 (2.4
Never smoke	718 (66.5
Having at least one underlying medical disease	, 10 (000
Yes	198 (18.3
No	882 (81.7
Personally reported with COVID-19	`
Yes	152 (14.1
No	721 (66.9
Don't know	204 (18.9
Reported any family member (s) infected with COVID-	,

19	
Yes	1022 (94.9)
No	0(0.0)
Don't know	55 (5.1)
Had tested for COVID-19	
Yes	440 (40.9)
No	637 (59.1)



Table2 Bivariate analysis correlates of getting a COVID-19 vaccine for participant characteristics

	Willingness to ta	ake the vaccine (n = 889)	
Characteristic	Yes	No	P.value
	n (%)	n (%)	
Gender			
Female	296 (58.3)	212 (41.7)	< 0.0001
Male	268 (70.3)	113 (29.7)	
Age groups (years)			
18 - 24	219 (73.5)	79 (26.5)	
25 - 34	161 (61.0)	103 (39.0)	< 0.0001
35 – 44	106 (56.1)	83 (43.9)	
> 45	78 (56.5)	60 (43.5)	
Geographical region			
Middle of West Bank	139 (57.4)	103 (42.6)	
North of West Bank	83 (68.6)	38 (31.4)	< 0.0001
South of West Bank	270 (61.2)	171 (38.8)	
Gaza Strip	72 (84.7)	13 (15.3)	
Locality	` ,		
City	341 (64.8)	185 (35.2)	
Village	184 (62.0)	113 (38.0)	0.53
Camp	39 (59.1)	27 (40.9)	
Marital Status			
Married	280 (68.3)	193 (33.6)	0.0050
Not married	284 (59.2)	132 (40.8)	
Educational level			
Diploma or less	56 (57.7)	41 (42.3)	
Bachelor	380 (65.3)	202 (34.7)	0.25
Higher education	128 (61.0)	82 (39.0)	
Employment status	247 (64.9)	124 (25.2)	0.46
Health professionals	247 (64.8)	134 (35.2)	0.46
Non health professionals  Income	317 (62.4)	191 (37.6)	
Excellent	45 (64.3)	25 (35.7)	
Very good	166 (63.6)	95 (36.4)	0.0050
Good	272 (66.2)	139 (33.8)	0.0030
Less than good	36 (43.9)	46 (56.1)	
Bad	27 (75.0)	9 (25.0)	
Very bad	18 (62.1)	11 (37.9)	
Smoking status	()	()	
Cigarette only	88 (65.7)	46 (34.3)	
Shisha only	87 (71.3)	35 (28.7)	
Cigarette and shisha	13 (61.9)	8 (38.1)	0.069
Electronic cigarette	6 (100.0)	0 (0.0)	
Ex-smoker	17 (73.9)	6 (26.1)	
Never smoke	353 (60.5)	230 (39.5)	
Having at least one underlying medical			
disease	0.0 (		
Yes	92 (62.2)	56 (37.8)	0.72

No	472 (63.7)	269 (36.3)	
Personally reported with COVID-19	()	(* (* * * * * )	
Yes	82 (65.1)	44 (34.9)	
No	381 (63.6)	218 (36.4)	0.82
Don't know	101 (61.6)	63 (38.8)	
Reported any family member (s) infected	()	(50.0)	
with COVID-19			
Yes	540 (64.1)	303 (35.9)	
No	0 (0.0)	0 (0.0)	0.10
Don't know	24 (47.8)	22 (52.2)	
Had tested for COVID-19	,	,	
Yes	242 (64.0)	136 (36.0)	0.76
No	322 (63.0)	189 (37.0)	
	. ,	, ,	

Table 3 Attitude of study participant's toward getting a COVID-19 vaccine

Would you agree to participate in clinical trials for testing efficacy of COVID-19 vaccine?         211 (91.7)         19 (8.3)         400000           Disagree         291 (50.4)         286 (49.6)         <0.0001           Don't know         20 (275.6)         20 (24.4)         20 (20.4)           Would you agree to pay to get the vaccine, if not provided freely?         381 (94.1)         24 (5.9)         20 (20.4)           Agree         381 (94.1)         24 (5.9)         20.0001           Disagree         123 (30.4)         282 (69.6)         <0.0001           Don't know         60 (75.9)         19 (24.1)            Would you get the vaccine from another country which either produces it, or has it; if not available in Palestine?         234 (92.5)         19 (7.5)         <0.0001           Agree         181 (39.8)         274 (60.2)         <0.0001           Don't know         149 (82.3)         32 (17.7)         <0.0001           Would you advise people to get the COVID-19 vaccine?         468 (91.9)         41 (8.1)         <0.0001           Brisagree         468 (91.9)         44 (9.1)         <0.0001           Don't know         30 (4)         295 (45.7)         <0.0001           Brisagree         76 (22.8)         257 (77.2)         <0.0001	Question	Willing to take the vaccine (n = 889)			
testing efficacy of CÖVID-19 vaccine?           Agree         291 (50.4)         286 (49.6)         <0.0001           Disagree         291 (50.4)         286 (49.6)         <0.0001           Don't know         62 (75.6)         20 (24.4)         ************************************				P. value	
Agree         211 (91.7)         19 (8.3)           Disagree         291 (50.4)         286 (49.6)         <0.0001					
Disagree         291 (50.4)         286 (49.6)         <0.0001           Would you agree to pay to get the vaccine, if not provided freely?         381 (94.1)         24 (5.9)         <0.0001           Disagree         381 (94.1)         24 (5.9)         <0.0001           Don't know         60 (75.9)         19 (24.1)            Would you get the vaccine from another country         which either produces it, or has it; if not available in Palestine?         234 (92.5)         19 (7.5)            Agree         234 (92.5)         19 (7.5)             Disagree         181 (39.8)         274 (60.2)         <0.0001           Don't know         149 (82.3)         32 (17.7)            Would you advise people to get the COVID-19 vaccine?         468 (91.9)         41 (8.1)            Disagree         16 (7.8)         189 (92.2)         <0.0001           Don't know         80 (54.3)         95 (45.7)            Would you take the COVID-19, if has mild side effects?         437 (90.9)         44 (9.1)            Disagree         76 (22.8)         257 (77.2)         <0.0001           Don't know         51 (68.0)         24 (32.0)            Score of attitude toward COVID-19 vaccine*	testing efficacy of COVID-19 vaccine?				
Don't know   G2 (75.6)   20 (24.4)   Would you agree to pay to get the vaccine, if not provided freely?   Agree   381 (94.1)   24 (5.9)   Disagree   123 (30.4)   282 (69.6)   <0.0001   Don't know   60 (75.9)   19 (24.1)   Would you get the vaccine from another country which either produces it, or has it; if not available in Palestine?   Agree   234 (92.5)   19 (7.5)   Disagree   181 (39.8)   274 (60.2)   <0.0001   Don't know   149 (82.3)   32 (17.7)   Would you advise people to get the COVID-19 vaccine?   Agree   468 (91.9)   41 (8.1)   Disagree   46 (7.8)   89 (92.2)   <0.0001   Don't know   80 (54.3)   95 (45.7)   Would you take the COVID-19, if has mild side effects?   Agree   437 (90.9)   44 (9.1)   Disagree   437 (90.9)   44 (9.1)   Disagree   437 (90.9)   24 (32.0)   Score of attitude toward COVID-19 vaccine*   41 (8.3)   232 (91.7)   (1)   61 (44.5)   49 (55.5)   (2)   104 (85.2)   18 (14.8)   <0.0001   (3)   157 (96.3)   6 (3.7)   (4) (4)   162 (95.3)   8 (4.7)   (5)   (71 (100.0)   0 (0.0)   (5)   (5)   (71 (100.0)   0 (0.0)   (5)   (5) (71 (100.0)   0 (0.0)   (5) (5) (71 (100.0)   79 (34.1)   <0.0001   (5) (60.001)   (5) (60.001)   (5) (60.001)   (5) (60.001)   (5) (60.001)   (5) (60.001)   (5) (60.001)   (5) (60.001)   (5) (60.001)   (5) (60.001)   (60.0	Agree	211 (91.7)	19 (8.3)		
Would you agree to pay to get the vaccine, if not provided freely?           Agree         381 (94.1)         24 (5.9)         <0.0001           Disagree         123 (30.4)         282 (69.6)         <0.0001	Disagree	291 (50.4)	286 (49.6)	< 0.0001	
provided freely?           Agree         381 (94.1)         24 (5.9)         20.0001           Disagree         123 (30.4)         282 (69.6)         <0.0001	Don't know	62 (75.6)	20 (24.4)		
freely?         Agree         381 (94.1)         24 (5.9)         -0.0001           Disagree         123 (30.4)         282 (69.6)         <0.0001	Would you agree to pay to get the vaccine, if not				
Agree       381 (94.1)       24 (5.9)         Disagree       123 (30.4)       282 (69.6)       <0.0001	provided				
Disagree   123 (30.4)   282 (69.6)   <0.0001	freely?				
Don't know   60 (75.9)   19 (24.1)   Would you get the vaccine from another country which either produces it, or has it; if not available in Palestine?  Agree   234 (92.5)   19 (7.5)	Agree	381 (94.1)	24 (5.9)		
Would you get the vaccine from another country which either produces it, or has it; if not available in Palestine?           Agree         234 (92.5)         19 (7.5)           Disagree         181 (39.8)         274 (60.2)         <0.0001	Disagree	123 (30.4)	282 (69.6)	< 0.0001	
which either produces it, or has it; if not available in Palestine?         Agree       234 (92.5)       19 (7.5)         Disagree       181 (39.8)       274 (60.2)       <0.0001	Don't know	60 (75.9)	19 (24.1)		
Palestine?         Agree       234 (92.5)       19 (7.5)         Disagree       181 (39.8)       274 (60.2)       <0.0001	Would you get the vaccine from another country				
Agree       234 (92.5)       19 (7.5)         Disagree       181 (39.8)       274 (60.2)       <0.0001	which either produces it, or has it; if not available in				
Disagree       181 (39.8)       274 (60.2)       <0.0001	Palestine?				
Disagree       181 (39.8)       274 (60.2)       <0.0001	Agree	234 (92.5)	19 (7.5)		
Don't know       149 (82.3)       32 (17.7)         Would you advise people to get the COVID-19 vaccine?         Agree       468 (91.9)       41 (8.1)         Disagree       16 (7.8)       189 (92.2)       <0.0001			. ,	< 0.0001	
Agree       468 (91.9)       41 (8.1)         Disagree       16 (7.8)       189 (92.2)       <0.0001		` /			
Agree       468 (91.9)       41 (8.1)         Disagree       16 (7.8)       189 (92.2)       <0.0001	Would you advise people to get the COVID-19 vaccine?	,	,		
Disagree       16 (7.8)       189 (92.2)       <0.0001		468 (91.9)	41 (8.1)		
Don't know       80 (54.3)       95 (45.7)         Would you take the COVID-19, if has mild side effects?         Agree       437 (90.9)       44 (9.1)         Disagree       76 (22.8)       257 (77.2)       <0.0001				< 0.0001	
Would you take the COVID-19, if has mild side effects?Agree $437 (90.9)$ $44 (9.1)$ Disagree $76 (22.8)$ $257 (77.2)$ $<0.0001$ Don't know $51 (68.0)$ $24 (32.0)$ Score of attitude toward COVID-19 vaccinea(0) $21 (8.3)$ $232 (91.7)$ (1) $61 (44.5)$ $49 (55.5)$ (2) $104 (85.2)$ $18 (14.8)$ $<0.0001$ (3) $157 (96.3)$ $6 (3.7)$ (4) $162 (95.3)$ $8 (4.7)$ (5) $71 (100.0)$ $0 (0.0)$ Low score $21 (8.3)$ $232 (91.7)$ Moderate score $153 (65.9)$ $79 (34.1)$ $<0.0001$		` ′			
Agree       437 (90.9)       44 (9.1)         Disagree       76 (22.8)       257 (77.2)       <0.0001	Would you take the COVID-19, if has mild side effects?	,	,		
Disagree       76 (22.8)       257 (77.2)       <0.0001         Don't know       51 (68.0)       24 (32.0)         Score of attitude toward COVID-19 vaccine <sup>a</sup> (0)       21 (8.3)       232 (91.7)         (1)       61 (44.5)       49 (55.5)         (2)       104 (85.2)       18 (14.8)       <0.0001	·	437 (90.9)	44 (9.1)		
Don't know       51 (68.0)       24 (32.0)         Score of attitude toward COVID-19 vaccine <sup>a</sup> 21 (8.3)       232 (91.7)         (1)       61 (44.5)       49 (55.5)         (2)       104 (85.2)       18 (14.8)       <0.0001			` /	< 0.0001	
Score of attitude toward COVID-19 vaccine <sup>a</sup> (0)       21 (8.3)       232 (91.7)         (1)       61 (44.5)       49 (55.5)         (2)       104 (85.2)       18 (14.8)       <0.0001			` /		
(0)       21 (8.3)       232 (91.7)         (1)       61 (44.5)       49 (55.5)         (2)       104 (85.2)       18 (14.8)       <0.0001			,		
(1)       61 (44.5)       49 (55.5)         (2)       104 (85.2)       18 (14.8)       <0.0001		21 (8.3)	232 (91.7)		
(2)       104 (85.2)       18 (14.8)       <0.0001		. , ,			
(3)       157 (96.3)       6 (3.7)         (4)       162 (95.3)       8 (4.7)         (5)       71 (100.0)       0 (0.0)         Low score       21 (8.3)       232 (91.7)         Moderate score       153 (65.9)       79 (34.1)       <0.0001				< 0.0001	
(4)     162 (95.3)     8 (4.7)       (5)     71 (100.0)     0 (0.0)       Low score     21 (8.3)     232 (91.7)       Moderate score     153 (65.9)     79 (34.1)     <0.0001			` ′		
(5)     71 (100.0)     0 (0.0)       Low score     21 (8.3)     232 (91.7)       Moderate score     153 (65.9)     79 (34.1)     <0.0001		` '			
Low score 21 (8.3) 232 (91.7) Moderate score 153 (65.9) 79 (34.1) <0.0001		` ′			
Moderate score 153 (65.9) 79 (34.1) <0.0001					
		` /	` /	< 0.0001	
	High score	157 (96.3)	6 (3.7)	-0.0001	

<sup>&</sup>lt;sup>a</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the 1<sup>st</sup> 1/3 of the answers), moderate score (represents the 2<sup>nd</sup> 1/3 of the answers), and high score (represents the 3<sup>rd</sup> 1/3 of the answers).

Table 4 Multivariate Logistic Regression of Willingness to get a COVID-19 Vaccine

Variable	Odds ratio	95% Confidence Interval	P.value
Gender	1400	Interval	
Female	1.00		
Male	0.86	0.425 - 1.754	0.68
Age group (years)	0.60	0.423 - 1.734	0.00
18-24	1.00		
25-34	0.22	0.079 - 0.594	0.0030
	0.22	0.079 - 0.394 0.031 - 0.468	
35-44			0.0020
>45	0.11	0.024 - 0.472	0.0030
Geographical region	1.00		
Center of West Bank	1.00	0.420 4.000	0.52
North of West Bank	1.47	0.439 - 4.909	0.53
South of West Bank	1.51	0.671 - 3.777	0.32
Gaza Strip	7.13	1.679 - 30.303	0.0080
Locality			
City	1.00		
Village	1.02	0.484 - 2.161	0.95
Camp	2.36	0.701 - 7.945	0.17
Marital Status			
Not married	1.00		
Married	4.48	1.668 - 12.044	0.0030
Educational level			
Diploma or less	1.00		
Bachelor	0.65	0.124 - 1.629	0.22
Higher education	0.85	0.162 - 2.636	0.55
Employment status	0.00	0.102 2.050	0.00
Health professionals	1.00		
Non health professionals	0.85	0.412 - 1.767	0.67
Knowledge score towards nature of the virus		0.412 1.707	0.07
Low	1.00		
Moderate	0.51	0.224 - 1.173	0.11
	0.31		0.011
High	0.18	0.065 - 0.492	0.0010
Knowledge score towards treatment and			
prevention	1.00		
Low	1.00	0.000 1.000	o 15
Moderate	0.74	0.332 - 1.629	0.47
High	0.77	0.282 - 2.077	0.60
Knowledge Score towards priority groups			
Low	1.00		
Moderate	1.60	0.768 - 3.318	0.21
High	1.23	0.386 - 4.924	0.73
Attitude Score towards vaccination			
Low	1.00		
Moderate	13.91	6.042 - 32.041	< 0.0001
High	110.62	28.329 - 431.0	< 0.0001
Frust in vaccination score towards	-		-
vaccination			
Low	1.00		
Moderate	2.90	1.109 - 7.073	0.029
High	11.80	4.092 - 34.006	< 0.0001
111511	11.00	7.072 37.000	`0.0001

## Supplement Table 1 Willing to be vaccinated by Knowledge of study population about the nature of COVID-19 virus

Question	Willing	to take the vaccine (1	n = 889)
	Yes n (%)	No n (%)	P. value
What is COVID-19?	` ,	` ,	
Real virus	503 (69.1)	225 (30.1)	
Fabricated virus	54 (38.8)	85 (61.2)	< 0.0001
I Don't know what is COVID-19	7 (38.9)	11 (61.1)	
COVID-19 does not exist	0(0.0)	4 (100.0)	
Do you think that you are susceptible			
to get the COVID-19 infection?			
Yes	542 (64.6)	297 (35.4)	
No	12 (47.8)	11 (52.2)	0.012
Don't know	11 (40.7)	16 (59.3)	
Do you think washing hands for 20 seconds will limit the COVID-19 spread?			
Yes	499 (64.6)	274 (35.4)	
No	52 (55.3)	42 (44.7)	0.20
Don't know	13 (59.1)	9 (40.9)	
Do you think wearing the mask correctly			
will aid to limit COVID-19 spread?			
Yes	533 (66.1)	273 (33.9)	
No	26 (38.8)	41 (61.2)	< 0.0001
Don't know	5 (31.3)	11 (68.7)	
Do you think keeping a safe distance of at			
least one meter from others will help to restrict	•		
COVID-19 spread?			
Yes	534 (64.9)	289 (35.1)	0.00=0
No	23 (45.1)	28 (54.9)	0.0070
Don't know	7 (46.7)	8 (53.3)	
Do you think that following the health			
instructions compared			
with the possible COVID-19 vaccine will limit			
the spread of			
the corona infection?	183 (62.6)	288 (27.4)	
Yes No	483 (62.6) 54 (66.7)	288 (37.4) 27 (33.3)	0.36
Don't know	27 (73.0)	10 (27.0)	0.30
Score of knowledge about the nature of	21 (13.0)	10 (27.0)	
COVID-19 virus <sup>a</sup>			
(0)	0 (0.0)	4 (100.0)	
(1)	1 (16.7)	5 (83.3)	
(2)	11 (47.8)	12 (52.2)	
(3)	12 (42.9)	16 (57.1)	
(4)	32 (45.7)	38 (54.3)	< 0.0001
(5)	141 (62.9)	83 (37.1)	
<b>(6)</b>	367 (68.7)	167 (31.3)	
low knowledge score	135 (60.0)	90 (40.0)	
	-22 (03.0)	( )	

 Moderate knowledge score
 298 (68.7)
 136 (31.3)
 0.050

 High knowledge score
 131 (57.0)
 99 (43.0)

<sup>a</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the  $1^{st}$  1/3 of the answers), moderate score (represents the  $2^{nd}$  1/3 of the answers), and high score (represents the  $3^{rd}$  1/3 of the answers).

## Supplement Table2 Study population willingness to be vaccinated based on knowledge about prevention and treatment

Question	Willing to take the vaccine (n = 889)		
	Yes n (%)	No n (%)	P.value
Do you think antiviral medications will help in recovery from			
COVID-19 infection?	100 (62.0)	(2 (2 ( 0)	
Yes	108 (63.2)	63 (36.8)	0.22
No Don't know	232 (66.7)	116 (33.3) 146 (39.5)	0.23
Do you think anti-malarial medications will help in treating	224 (60.5)	140 (39.3)	
COVID-19 infection?			
Yes	43 (59.7)	29 (40.3)	
No No	274 (66.8)	136 (33.2)	0.15
Don't know	247 (60.7)	160 (39.3)	0.13
Do you think consumption of vitamins such as vitamin C will	247 (00.7)	100 (37.3)	
help in COVID-19 prevention?			
Yes	264 (56.7)	202 (43.3)	
No	212 (73.4)	77 (26.6)	< 0.0001
Don't know	88 (65.7)	46 (34.3)	
Do you think using plasma from recovered COVID-19	(12,11)	( , , ,	
patients			
will help in treating COVID-19 infection?			
Yes	222 (66.3)	113 (33.7)	
No	130 (68.4)	60 (31.6)	0.024
Don't know	212 (58.2)	152 (41.8)	
Do you think the future COVID-19 vaccine will be safe?			
Yes	220 (90.5)	23 (9.5)	
No	61 (27.7)	159 (72.3)	< 0.0001
Don't know	283 (66.4)	143 (33.6)	
Do you think the future COVID-19 vaccine will cause side			
effects? Yes	261 (55.3)	211 (44.7)	
No No	48 (78.7)	13 (21.3)	< 0.0001
Don't know	255 (71.6)	101 (28.4)	<0.0001
Do you think the future COVID-19 vaccine should be given	233 (71.0)	101 (20.4)	
annually?			
Yes	247 (74.4)	85 (25.6)	
No	137 (52.9)	122 (47.1)	< 0.0001
Don't know	180 (60.4)	118 (39.6)	10.0001
Do you think the future COVID-19 vaccine should be given	()	- (22.2)	
separately from other vaccines?			
Yes	366 (64.0)	206 (36.0)	
No	54 (63.5)	31 (36.5)	0.88
Don't know	144 (62.1)	88 (37.9)	
Do you think the future COVID-19 vaccine will increase	, ,	, ,	
· · · · · ·			
corona			

Yes	44 (38.3)	71 (61.7)	
No	349 (79.0)	93 (21.0)	< 0.0001
Don't know	171 (51.5)	161 (48.5)	
Score of knowledge about the COVID-19 prevention and			
treatment <sup>b</sup>			
(0)	27 (57.4)	20 (42.6)	
(1)	83 (64.3)	46 (35.7)	
(2)	112 (68.3)	52 (31.7)	
(3)	121 (58.2)	87 (41.8)	0.31
(4)	99 (65.1)	53 (34.9)	
(5)	66 (64.7)	36 (35.3)	
(6)	32 (62.7)	19 (37.3)	
(7)	11 (52.4)	10 (47.6)	
(8)	7 (77.8)	2 (22.2)	
(9)	6 (100.0)	0(0.0)	
Low score	110 (62.5)	66 (37.5)	
Moderate score	233 (62.6)	139 (37.4)	0.85
High score	99 (65.1)	53 (34.9)	

<sup>b</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the 1<sup>st</sup> 1/3 of the answers), moderate score (represents the 2<sup>nd</sup> 1/3 of the answers), and high score (represents the 3<sup>rd</sup> 1/3 of the answers).

## Supplement Table3 Willingness to be vaccinated based on study population knowledge on priority groups to get the vaccine

Peach   Peac	Question	Willing to take the vaccine $(n = 889)$		
to newborn?           Yes         230 (83.0)         47 (17.0)           No         195 (48.4)         208 (51.6)         <0.0001           Don't know         139 (66.5)         70 (33.5)         ****           Do you think future COVID-19 should be given to children younger than 18 years?         ****         ****         ****         <0.0001         ***         ****         0.0001         ****         ****         0.0001         ****         0.0001         ****         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         ****         0.0001         0				P.value
Yes         230 (83.0)         47 (17.0)            No         195 (48.4)         208 (51.6)         <0.0001	·			
No         195 (48.4)         208 (51.6)         <0.0001           Dor you think future COVID-19 should be given to children younger than 18 years?         343 (81.7)         77 (18.3)            Yes         343 (81.7)         77 (18.3)         <0.0001		(0-0)		
Don't know				
No you think future COVID-19 should be given to children younger than 18 years?   Yes				< 0.0001
to children younger than 18 years?           Yes         343 (81.7)         77 (18.3)           No         119 (41.9)         165 (58.1)         <0.0001		139 (66.5)	70 (33.5)	
Yes       343 (81.7)       77 (18.3)         No       119 (41.9)       165 (58.1)       <0.0001				
No         119 (41.9)         165 (58.1)         <0.0001           Don't know         102 (55.1)         83 (44.9)           Do you think future COVID-19 should be given to pregnant women?           Yes         256 (81.3)         59 (18.7)           No         121 (41.0)         174 (59.0)         <0.0001           Don't know         187 (67.0)         92 (33.0)            Do you think future COVID-19 should be given to elderly people?         498 (72.8)         186 (27.2)            No         22 (23.9)         70 (76.1)         <0.0001           Don't know         44 (38.9)         69 (61.1)         <0.0001           Do you think future COVID-19 should be given to immunocompromised patients?         415 (71.7)         164 (28.3)            Yes         415 (71.7)         164 (28.3)             No         56 (39.4)         86 (60.6)         <0.0001           Don't know         93 (55.4)         75 (44.6)            Score of knowledge about priority groups to be vaccimated*         (0)         33 (23.6)         107 (76.4)            (1)         40 (44.0)         51 (56.0)          <0.0001           (2)         <		242 (01.7)	77 (10.2)	
Don't know   102 (55.1)   83 (44.9)				.0.0001
Do you think future COVID-19 should be given to pregnant women?           Yes         256 (81.3)         59 (18.7)           No         121 (41.0)         174 (59.0)         <0.0001				<0.0001
to pregnant women?           Yes         256 (81.3)         59 (18.7)           No         121 (41.0)         174 (59.0)         <0.0001		102 (55.1)	83 (44.9)	
Yes       256 (81.3)       59 (18.7)         No       121 (41.0)       174 (59.0)       <0.0001				
No       121 (41.0)       174 (59.0)       <0.0001         Don't know       187 (67.0)       92 (33.0)         Do you think future COVID-19 should be given to elderly people?         Yes       498 (72.8)       186 (27.2)         No       22 (23.9)       70 (76.1)       <0.0001         Don't know       44 (38.9)       69 (61.1)       <0.0001         Do you think future COVID-19 should be given to immunocompromised patients?       415 (71.7)       164 (28.3)          Yes       415 (71.7)       164 (28.3)        <0.0001         Don't know       56 (39.4)       86 (60.6)       <0.0001         Score of knowledge about priority groups to be vaccinated*       (0)       33 (23.6)       107 (76.4)          (1)       40 (44.0)       51 (56.0)        <0.0001         (2)       121 (59.9)       81 (40.1)       <0.0001         (3)       137 (78.3)       38 (21.7)          (4)       116 (77.3)       34 (22.7)          (5)       117 (89.3)       14 (10.7)          Low knowledge score       73 (31.6)       158 (68.4)       <0.0001         Moderate knowledge score       258 (68.4)       119 (31.4) <td></td> <td>256 (91.2)</td> <td>50 (19.7)</td> <td></td>		256 (91.2)	50 (19.7)	
Don't know         187 (67.0)         92 (33.0)           Do you think future COVID-19 should be given to elderly people?           Yes         498 (72.8)         186 (27.2)           No         22 (23.9)         70 (76.1)         <0.0001		, ,	` '	<0.0001
Do you think future COVID-19 should be given to elderly people?           Yes         498 (72.8)         186 (27.2)           No         22 (23.9)         70 (76.1)         <0.0001		· · · · · ·	` /	<0.0001
to elderly people?         Yes $498 (72.8)$ $186 (27.2)$ $(70.001)$ $($		187 (07.0)	92 (33.0)	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	·			
No       22 (23.9)       70 (76.1)       <0.0001         Don't know       44 (38.9)       69 (61.1)         Do you think future COVID-19 should be given to immunocompromised patients?         Yes       415 (71.7)       164 (28.3)         No       56 (39.4)       86 (60.6)       <0.0001         Don't know       93 (55.4)       75 (44.6)          Score of knowledge about priority groups to be vaccinated*       (0)       33 (23.6)       107 (76.4)          (1)       40 (44.0)       51 (56.0)           (2)       121 (59.9)       81 (40.1)       <0.0001         (3)       137 (78.3)       38 (21.7)          (4)       116 (77.3)       34 (22.7)          (5)       117 (89.3)       14 (10.7)         Low knowledge score       73 (31.6)       158 (68.4)          Moderate knowledge score       258 (68.4)       119 (31.4)       <0.0001	V 1 1	498 (72.8)	186 (27.2)	
Don't know       44 (38.9)       69 (61.1)         Do you think future COVID-19 should be given to immunocompromised patients?         Yes       415 (71.7)       164 (28.3)         No       56 (39.4)       86 (60.6)       <0.0001         Don't know       93 (55.4)       75 (44.6)          Score of knowledge about priority groups to be vaccinated <sup>c</sup> (0)       33 (23.6)       107 (76.4)          (1)       40 (44.0)       51 (56.0)          (2)       121 (59.9)       81 (40.1)       <0.0001         (3)       137 (78.3)       38 (21.7)          (4)       116 (77.3)       34 (22.7)          (5)       117 (89.3)       14 (10.7)         Low knowledge score       73 (31.6)       158 (68.4)         Moderate knowledge score       258 (68.4)       119 (31.4)       <0.0001				<0.0001
Do you think future COVID-19 should be given to immunocompromised patients?         Yes       415 (71.7)       164 (28.3)         No       56 (39.4)       86 (60.6)       <0.0001			, ,	₹0.0001
to immunocompromised patients?         Yes       415 (71.7)       164 (28.3)         No       56 (39.4)       86 (60.6)       <0.0001		11 (30.5)	07 (01.1)	
Yes       415 (71.7)       164 (28.3)         No       56 (39.4)       86 (60.6)       <0.0001	·			
No       56 (39.4)       86 (60.6)       <0.0001         Don't know       93 (55.4)       75 (44.6)         Score of knowledge about priority groups to be vaccinated*         (0)       33 (23.6)       107 (76.4)         (1)       40 (44.0)       51 (56.0)         (2)       121 (59.9)       81 (40.1)       <0.0001         (3)       137 (78.3)       38 (21.7)         (4)       116 (77.3)       34 (22.7)         (5)       117 (89.3)       14 (10.7)         Low knowledge score       73 (31.6)       158 (68.4)         Moderate knowledge score       258 (68.4)       119 (31.4)       <0.0001		415 (71.7)	164 (28.3)	
Don't know         93 (55.4)         75 (44.6)           Score of knowledge about priority groups to be vaccinated <sup>c</sup> (0)         33 (23.6)         107 (76.4)           (1)         40 (44.0)         51 (56.0)           (2)         121 (59.9)         81 (40.1)         <0.0001				< 0.0001
Score of knowledge about priority groups to be vaccinated <sup>c</sup> (0)         33 (23.6)         107 (76.4)           (1)         40 (44.0)         51 (56.0)           (2)         121 (59.9)         81 (40.1)         <0.0001				
(0)       33 (23.6)       107 (76.4)         (1)       40 (44.0)       51 (56.0)         (2)       121 (59.9)       81 (40.1)       <0.0001				
(2)       121 (59.9)       81 (40.1)       <0.0001			107 (76.4)	
(3)       137 (78.3)       38 (21.7)         (4)       116 (77.3)       34 (22.7)         (5)       117 (89.3)       14 (10.7)         Low knowledge score       73 (31.6)       158 (68.4)         Moderate knowledge score       258 (68.4)       119 (31.4)       <0.0001		40 (44.0)	51 (56.0)	
(4)       116 (77.3)       34 (22.7)         (5)       117 (89.3)       14 (10.7)         Low knowledge score       73 (31.6)       158 (68.4)         Moderate knowledge score       258 (68.4)       119 (31.4)       <0.0001	(2)		81 (40.1)	< 0.0001
(5)       117 (89.3)       14 (10.7)         Low knowledge score       73 (31.6)       158 (68.4)         Moderate knowledge score       258 (68.4)       119 (31.4)       <0.0001	(3)	137 (78.3)	38 (21.7)	
(5)       117 (89.3)       14 (10.7)         Low knowledge score       73 (31.6)       158 (68.4)         Moderate knowledge score       258 (68.4)       119 (31.4)       <0.0001	(4)	116 (77.3)	34 (22.7)	
Moderate knowledge score 258 (68.4) 119 (31.4) <0.0001		117 (89.3)	14 (10.7)	
	Low knowledge score	73 (31.6)	158 (68.4)	
High knowledge sore 116 (77.3) 34 (22.7)	Moderate knowledge score	258 (68.4)	119 (31.4)	< 0.0001
6	High knowledge sore	116 (77.3)	34 (22.7)	

The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the  $1^{st}$  1/3 of the answers), moderate score (represents the  $2^{nd}$  1/3 of the answers), and high score (represents the  $3^{rd}$  1/3 of the answers).



## Supplement Table4 Attitude of study participant's toward getting a COVID-19 vaccine based on their trust of vaccination

Question		Willing to take the vaccine	
	Yes n (%)	No n (%)	P. value
Would you give the COVID-19 vaccine to your	` '		
children			
if available?	406	25 (5 8)	
Agree	(94.2)	25 (5.8)	
Disagree	75 (21.9)	267	< 0.0001
2 1548.00	(21.5)	(78.1)	10.0001
Don't know	83 (71.6)	33	
		(28.4)	
Do you trust in scientists and researchers			
thoughts			
about future COVID-19 vaccine?	475	65	
Agree	475 (88.0)	65 (12.0)	
Disagree	30 (14.6)	175	< 0.0001
Disagree	30 (11.0)	(85.4)	(0.0001
Don't know	59 (41.0)	85	
	, ,	(59.0)	
Do you the period (6 to 12 months) in which the so develop a COVID-19 vaccine is enough?	cientists tryin	g to	
Ye	261	74	
	(77.9)	(22.1)	
No	163	137	< 0.0001
D 241	(54.3)	(45.7)	
Don't know	140 (55.1)	114 (44.9)	
Do you think information about COVID-19 vaccine production	(33.1)	(44.9)	
is clear and should be open to public?			
Yes	264	93	
	(73.9)	(26.1)	
No	200	178	< 0.0001
D 4.1	(52.9)	(47.1)	
Don't know	100	54	
Score of attitude toward COVID-19 vaccine versu	(64.9)	(35.1)	
(0)	18 (10.8)	149	
(0)	10 (10.0)	(89.2)	
(1)	73 (38.8)	115	
\-/	.5 (55.6)	(61.2)	
(2)	189	42	< 0.0001
	(81.8)	(18.2)	
(3)	181	18 (9.0)	
	(91.0)		

(4)	103 1 (1.0) (99.0)	
Low score	18 (10.8) 149	
	(89.2)	
Moderate score	73 (38.8) 115	< 0.0001
	(61.2)	
High score	189 42	
_	(81.8) (18.2)	

<sup>d</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the 1<sup>st</sup> 1/3 of the answers), moderate score (represents the 2<sup>nd</sup> 1/3 of the answers), and high score (represents the 3<sup>rd</sup> 1/3 of the answers). 



## The Office of the Dean of Research

Tel: 274 1241 - Fax: 2744440

P. O. Box: 9 - Bethlehem - Palestine

Research Ethics Committee Bethlehem University Chair, Prof Jamil Khader

Aug 26, 2020

To: Dr. Hanan Hazboun

Re: IRB Application

Dear Dr. Hanan,

I am pleased to inform you that your IRB application for the research project titled, "Evaluation of Population Belief in Palestine towards Future Corona Vaccine Knowledge and Attitude", was reviewed and approved by the Research Ethics Committee at Bethlehem University.

Please, be advised that this IRB does not substitute for the legal, regulatory and governance requirements, which could be required in addition to the ethical clearance that must be obtained for specific types of research.

Thank you very much for your cooperation in this matter and may you have our best wishes for the successful completion of your project.

Sincerely Jamil Khader
Prof. Jamil Khader, PhD

Dean of Research Bethlehem University

Bethlehem, Palestine

Tel: <u>+972-2-274-1241</u>/2, ext. 2377

STROBE Statement—Checklist of items that should be included in reports of cross-sectional studies

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2-3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of	5
Setting		recruitment, exposure, follow-up, and data collection	
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of	5
r articipants	O	participants	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders,	
variables	,	and effect modifiers. Give diagnostic criteria, if applicable	
 Data	8*	For each variable of interest, give sources of data and details of methods of	5
sources/measurement	8	assessment (measurement). Describe comparability of assessment methods if	
sources/measurement		there is more than one group	
Bias	9		
		Describe any efforts to address potential sources of bias	
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If	6
	10	applicable, describe which groupings were chosen and why	
Statistical methods	12	(a) Describe all statistical methods, including those used to control for	6
		confounding	
		(b) Describe any methods used to examine subgroups and interactions	
		(c) Explain how missing data were addressed	
		(d) If applicable, describe analytical methods taking account of sampling	
		strategy	
		( <u>e</u> ) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers	7
		potentially eligible, examined for eligibility, confirmed eligible, included in	
		the study, completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical,	
•		social) and information on exposures and potential confounders	
		(b) Indicate number of participants with missing data for each variable of	
		interest	
Outcome data	15*	Report numbers of outcome events or summary measures	7-9
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted	
	10	estimates and their precision (eg, 95% confidence interval). Make clear	
		which confounders were adjusted for and why they were included	

		(b) Report category boundaries when continuous variables were categorized	
		(c) If relevant, consider translating estimates of relative risk into absolute risk	
		for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and	
		sensitivity analyses	
Discussion	·		
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias	10
		or imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives,	9-14
		limitations, multiplicity of analyses, results from similar studies, and other	
		relevant evidence	
Generalisability	21	Discuss the generalisability (external validity) of the study results	
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study	14
		and, if applicable, for the original study on which the present article is based	

<sup>\*</sup>Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

# **BMJ Open**

#### Acceptance of COVID-19 vaccines in Palestine: A crosssectional online study

Journal:	BMJ Open
Manuscript ID	bmjopen-2021-053681.R1
Article Type:	Original research
Date Submitted by the Author:	21-Aug-2021
Complete List of Authors:	Zawahrah, Hassan; Jordan University of Science and Technology, Faculty of Medicine Saca-Hazboun , Hanan ; Bethlehem University, Faculty of Nursing and Health Science Melhem, Shatha; Jordan University of Science and Technology, Department of Obstetrics and Gynecology Adwan , Rabee; Makassed Charitable Society Hospital, Infectious Diseases Unit Sabateen, Ali; Augusta Victoria Hospital, Infectious Diseases Unit Abu-Rmeileh, Niveen; Birzeit University, Institute of Community and Public Health
<b>Primary Subject Heading</b> :	Public health
Secondary Subject Heading:	Epidemiology
Keywords:	COVID-19, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Infection control < INFECTIOUS DISEASES, INFECTIOUS DISEASES, PUBLIC HEALTH

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#### Acceptance of COVID-19 vaccines in Palestine: A cross-sectional online study

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#### **Abstract**

**Introduction:** In Palestine (West Bank and Gaza), there have been more than 320,890 known cases of COVID-19, resulting in 3452 deaths. The detrimental effects of the virus can be seen in the nation's health, economy, and government operations, leading to radical uncertainty that is exacerbated by the absence of any definitive treatment or vaccines. The level of knowledge about and trust in treatment and vaccination varies worldwide. This study aims to assess the willingness of Palestinians to receive a COVID-19 vaccine and their knowledge about such vaccines.

**Methods**: An online survey of adults over 18 years old (n = 1080) was conducted in Palestine in October 2020. Using multivariate logistic regression, we identified correlates of participants' willingness to get a COVID-19 vaccine.

**Results:** We found that about 63% of participants were willing to get a COVID-19 vaccine. However, acceptance varied with the specific demographic variables that were investigated. Females, married participants, and those aged 18-24 years are more likely to take the vaccine. Further, participants with good knowledge about the vaccine and its side effects are more willing to get the vaccine.

Conclusion: The availability of a safe and effective COVID-19 vaccine in Palestine is crucial to decrease the burden of COVID-19 morbidity and mortality. In addition, to ensure a high vaccination rate, health awareness campaigns should target those who are not willing to get the vaccine, especially those who are more vulnerable and the elderly.

#### Strengths and limitations

- This study is the first to estimate the willingness of people to receive a COVID-19 vaccine in Palestine
- This study has a good and high participation rate
- This study is a cross-sectional online survey, therefore it was subjective to participation bias

#### Introduction

The novel coronavirus (COVID-19) was first detected in Wuhan in 2019, signaling the start of a severe global pandemic. Since then, COVID-19 has infected over 107,532,472 people and caused 2,354,212 deaths worldwide. As of April 2021, COVID-19 has infected 317,961Palestinians and caused 3406 deaths. This has resulted in serious consequences for world health and the global economy and forced governments to operate in a context of radical uncertainty, as there were previously no definitive treatments or vaccines. Consequently, many countries have acknowledged these tremendous problems and are cooperating to improve the situation. Vaccines for COVID-19 are an important health measure to help bring the pandemic under control, and several promising vaccines have already been approved and are considered safe and effective. Several countries have started the process of vaccinating their populations using Pfizer/BioNTech, Moderna, Sputnik V, Sinopharm, and Oxford-AstraZeneca vaccines. Since the virus poses a significant threat to public health, vaccination is an essential intervention; however, public perception toward the uptake of COVID-19 vaccines has not yet been determined.

Determann and colleagues found that disease and vaccination programs influence respondents' receptiveness to vaccines during a pandemic, which affects vaccine uptake. Previous studies have shown that the general population's intention to accept or decline a vaccine is influenced by their perception of personal risk, attitude toward vaccination, and ethnicity. Kourlaba and colleagues reported that the acceptance rate for vaccination was 57.7% in Greece, while a behavioral model developed by Schwarzinger and colleagues predicted that 29.4% (95% CI: 28.6–30.2) of the French population of working age would refuse the COVID-19 vaccine.

The medical services in Palestine are fragmented and are provided by the Palestinian Ministry of Health (PMOH), non-governmental health institutions, military medical services, United Nations Relief and Works Agency(UNRWA), and the private sector. The number of medical cadres registered in various medical associations in Palestine has reached 31,873, of which 24,432 (76.6%) are in the West Bank and 7441 (23.3%) are in the Gaza Strip. Thus, after one year of battling with COVID-19, the health care system in Palestine is facing a crisis due to the spread and increase in the infection rate of COVID-19. Hospitals, which are already operating beyond their capacity, are being overloaded by new cases of COVID-19. Health providers are being faced with extraordinary levels of demand, as hospital beds are now essentially filled by COVID-19 cases and the number of infections is increasing. To decrease the incidence of COVID-19, lower the demand for intensive care, and reverse the course of the COVID-19 epidemic, a large portion of the population must be vaccinated within a short period. In the absence of prophylaxis through a vaccine, the surge in cases will likely continue.

Saied and colleagues observed that acceleration in the rate of vaccine development compared to the past had aroused speculation about whether or not such vaccines are safe to use. 12 Furthermore, they noted that the side effects of the new COVID-19 vaccinations are still unknown. People on social media are providing misleading information about the new vaccines. Consequently, WHO has administered a serious warning that this epidemic could turn into an "infodemic". This refers to a phenomenon that occurs when people start spreading debunked news and false information based on anecdotal evidence. 13 Qattan and colleagues state that people need to accept the vaccine to implement a vaccination program successfully; this requires that the government build more public trust in emergency-released vaccines. 14

Effective control of the COVID-19 pandemic via widespread vaccination will require achieving sufficient herd immunity among the population; for COVID-19, this requires a vaccination rate of about 67%. However, information is currently lacking about people's acceptance of COVID-19

vaccines and the factors that may influence their acceptance. The availability of such information will be beneficial for planning future campaigns to improve vaccine uptake. <sup>16</sup>Therefore; this study aims to assess the willingness of the general public to get a COVID-19 vaccine in Palestine (West Bank and Gaza).

#### Methods

We conducted a cross-sectional web-based study to assess the willingness of the Palestinian population to receive aCOVID-19 vaccine. Participation was limited to those who were 18 years or older and residing in Palestine. Data was gathered anonymously online through a self-administered questionnaire designed using Google Forms distributed on different venues on social media such as Facebook and WhatsApp platforms, universities and different unions websites. We anticipated a minimum sample of 384 responses using the 95% confidence interval for population, and we limited the study by two months, and accepted any response in this period. Participants (n =1080) were informed that participation was voluntary and confidential, can stop completing the survey at any time. This study obtained ethical approval from the Institutional Review Board at Bethlehem University.

#### **Data collection**

The survey items were developed based on information about the COVID-19 pandemic provided by the World Health Organization (WHO) (Supplement file 1).<sup>17</sup>The survey questionnaire consisted of several sections: demographic information, health status, and knowledge about the nature of the COVID-19 virus, treatment and prevention modalities. In addition, the survey collected information about priority groups that should be vaccinated and participants' willingness to be vaccinated.

Demographic data included questions about gender, age, geographical region, locality (city, village, or camp), marital status, educational level, employment status, income, smoking status, and disease status.

We then assessed items that might affect participants' willingness to be vaccinated, their knowledge regarding treatment modalities and prevention of COVID-19 and if such knowledge affected their willingness to be vaccinated. We asked participants whether certain medications would be of benefit to treat or prevent COVID-19 infection. Furthermore, participants were asked about the role of plasma from recovered COVID-19 patients in treating the infection. We also asked whether the vaccine would be safe or not once it is available and whether the vaccine would provide immunity against COVID-19 instead of transmitting the infection.

We also assessed the participants' knowledge of which priority groups should be vaccinated, and acceptance of COVID-19 vaccination was assessed by asking them about their willingness to get the vaccine once it becomes available in Palestine. In addition, trust in the vaccination process was evaluated by asking them if they would accept having their children vaccinated and if they trusted the scientists involved in COVID-19 vaccine development.

Knowledge and attitude scores were calculated by adding up the number of correct answers (i.e., the first answer option) for each question. Each variable was given equal weight, and each score was recoded into three equal groups.

#### 2.3. Statistical analysis

Analysis of the data was completed using IBM SPSS version 26.0. Descriptive measures are presented as frequencies and percentages. Pearson's chi-square was used for the comparison of categorical variables. Bivariate analysis was conducted to measure the correlation between participants' willingness to get a COVID-19 vaccine and other independent variables. Multivariate logistic regressions were also performed to identify the variables associated with vaccine acceptance among Palestinians. Results were considered significant when the p-value was less than 0·050. Confidence intervals (95% CI) and odds ratios (ORs) were also determined.

#### **Patient and Public Involvement**

No patients were involved in this study.

#### **Results**

#### Participant characteristics

Of the 1080 participants, half were young adults between the ages of 25 and 44 (49·9%) and more than half were female (58·6%). The majority of participants came from the south of West Bank (46·8%) and lived in the city (59·7%). Just over half of the participants were married (53·2%) and the vast majority had bachelor's degrees (66·0%). About  $41\cdot1\%$  of the participants were healthcare workers. Sixty-six and a half percent of participants never smoked, and only  $18\cdot3\%$  of participants had at least one medical disease. Less than half of the participants had been tested for COVID-19 ( $40\cdot9\%$ ). Only  $14\cdot1\%$  reported a personal history of COVID-19 infection, while 94.9% reported a history of COVID-19 infection among family members (Table 1).

#### Insert Table 1 here

#### Willingness to get a COVID-19 vaccine

Around 63% of participants were willing to get a COVID-19 vaccine (Table2). Based on participants' knowledge about the nature of the COVID-19 virus, participants who were willing to be vaccinated were those who considered COVID-19to be a real virus (69%), compared to those who believed it was fabricated (39%) and those who did not know what COVID-19 was (39%, p <0.001). Participants who thought they were susceptible toCOVID-19 infection were willing to take the vaccine (65%), compared to those who did not (48%). Participants those who did not know if they were susceptible (41%, p = 0.012), or if they thought that following safety measures (wearing a mask and keeping physical

distance), compared to those who did not believe in such measures and those who did not know (face masks: 66%, 39%, 31%, p < 0.001; distancing: 65%, 45%, 47%, p = 0.007) (Supplement file Table 1).

#### Insert Table2 here

The bivariate analysis measuring participants' willingness to be vaccinated against COVID-19 and their knowledge about the treatment and prevention of COVID-19 infection showed that those who were willing to get the vaccine were those who thought that it would be safe (91%), compared to those who did not think it would be safe (28%), and those who did not know (66%, p < 0.001). Participants were also more willing to get the vaccine if they thought that the vaccine would not cause side effects (79%), compared to those who thought that it would (55%), and those who did not know (72%, p < 0.001); if they thought that the vaccine should be given every year (74%), compared to those who thought it should not (53%), and those who did not know (60%, p < 0.001); and if they believed that the COVID-19 vaccine would not transmit the infection instead of providing immunity (79%), compared to those who believed that it would (38%), and those who did not know (52%, p < 0.001). Moreover, those who did not think that vitamins (such as vitamin C) and plasma from recovered COVID-19 patients would be of benefit for preventing infection were more willing to get the vaccine compared to those who answered "yes" or "do not know" (vitamins: 73%, 57%, 66%, p < 0.001; plasma: 68%, 66%, 58%, p = 0.024). Participants' knowledge about the utility of antiviral or anti-malarial medications to treat the infection, and giving the vaccine separately from other vaccines, did not significantly affect their willingness to receive the vaccine (Supplement file Table2).

Participants were in favor of distributing vaccines to all age groups, as well as pregnant women and the immunocompromised (Supplement file Table3). Participants' attitudes toward getting a COVID-19 vaccine (Table 3) were also assessed based on their trust in vaccination. Participants who were willing to receive the vaccine were those who agreed to give their children the vaccine (94%, p < 0.001). trusted scientists and researchers (88%, p < 0.001), thought that the period in which the vaccine was 

developed was sufficient (80%, p < 0.001), and thought that information regarding vaccine development should be clear and accessible (74%, p < 0.001), compared with those who disagreed or did not know (Supplement file Table4).

#### Insert Table3 here

In the multivariate logistic regression (Table4), participants were more likely to be willing to receive a COVID-19vaccine if they were married (OR = 4.48, 95%CI: 1.668–12.044), living in a camp (OR = 2.36, 95%CI: 0.701–7.945), or living in Gaza (OR = 7.13, 95%CI: 1.679–30.303). Participants who had high positive attitude scores toward vaccination would be more likely to accept the vaccine (OR = 1.62, 95%CI: 1.688–1.62), along with those who had moderate knowledge scores regarding which priority groups should be vaccinated (OR = 1.60, 95%CI: 0.768–3.318), and those who had high trust scores for vaccination were also more willing to get the COVID-19 vaccine (OR = 11.80, 95%CI: 4.092–34.006).

Participants were less likely to be willing to get a COVID-19 vaccine if they were male (OR = 0.86, 95%CI: 0.425-1.754), ages 45 and older (OR = 0.11, 95%CI: 0.024-0.472), had a bachelor's degree (OR = 0.65, 95%CI: 0.124-1.629), or were non-healthcare professionals (OR = 0.85, 95%CI: 0.412-1.767), and participants who had a high knowledge score regarding the nature of the COVID-19 virus (OR = 0.18, 95%CI: 0.065-0.492) and who had a moderate score toward the treatment and prevention of COVID-19 infection (OR = 0.74, 95%CI: 0.332-1.629).

#### Insert Table4 here

#### **Discussion**

This study aimed to evaluate the acceptance of COVID-19 vaccines among Palestinians. Around 63% of the study population showed a positive attitude toward vaccination against COVID-19. Our results were consistent with similar studies exploring the willingness of the population to be inoculated with 9

the COVID-19 vaccine in Saudi Arabia (64·7%), China (72·5%), and the USA (80%). <sup>18</sup>As vaccines become available, it will be necessary to monitor changes in people's willingness and how that will affect vaccine uptake, since people's intentions do not always reflect their actual behavior. <sup>16</sup>Having a better understanding of the factors influencing people's decisions to accept an emergency-released vaccine can help authorities to manage the pandemic better. <sup>19</sup>

Many studies have shown that willingness to receive a vaccine is linked to several factors, including the risk of being infected with the virus; the severity of the virus; the safety, efficacy, and adverse outcomes of the vaccine; a lack of knowledge about the nature of vaccine-preventable diseases; and misconceptions and misinformation related to the vaccine.<sup>18,19</sup>

This study has highlighted several factors that may increase or decrease people's willingness to receive the vaccine. Perceived risk of becoming infected was a positive predictor of the intention to be vaccinated. 18,19 Our results were consistent with those of previous studies and showed that 65% of participants believed that they could be susceptible to COVID-19 infection.

Although wearing a mask correctly and keeping a safe social distance are crucial for reducing the spread of COVID-19, the Centers for Disease Control and Prevention has stated that these measures alone will not be sufficient to stop the spread of the virus. Thus, using COVID-19 vaccines combined with these measures will be vital for stopping the pandemic.<sup>20</sup>As reported in our study, participants who understood the importance of the measures mentioned above were more willing to get the vaccine. Therefore, governments and health agencies should do more to try and increase public awareness of the effectiveness of these measures.

According to the CDC, none of the existing COVID-19 vaccines will cause people to become infected with COVID-19. Furthermore, they confirmed that all the vaccines had been carefully assessed through clinical trials. COVID-19 vaccines have also been shown to decrease the seriousness of infection even if a person does become infected.<sup>20</sup>This supports our finding where most participants shared the same 10

belief regarding the safety and effectiveness of the vaccine. Some participants who were reluctant to get the vaccine were worried about the side effects of the novel vaccine and its impact on their overall health. However, most of our study participants believed that the vaccine would not cause any serious side effects.

WHO has stated that every human being anywhere in the world who could benefit from a safe and effective COVID-19 vaccine should quickly have access to one. <sup>21</sup>Some of Palestine's neighboring countries such as Jordan and Egypt have started their vaccination campaigns, <sup>22</sup>and Palestinians also have the right to have fair and equal access to necessary health care, including COVID-19 vaccines, to face the burden of the pandemic, especially that physical implications such as path of the wall that has taken through West Bank and long-lived siege in Gaza that resulted in isolation from health care and making the vulnerable people in the society inaccessible to health services. <sup>9</sup>However, according to a correspondence published in The Lancet, the UN has stated that the majority of Palestinians are unlikely to have access to the available vaccines in the near future. <sup>23</sup>

As of March 2021, the limited vaccines that were available to Palestinians were used to cover the first phase of vaccination according to the priorities suggested by a study conducted in China; this includes maintaining necessary services such as healthcare and national security. The second stage will then aim to reduce the number of severe cases, thereby decreasing the number of hospitalizations, admissions to intensive care units, and deaths. As a third stage, vaccination could be extended to the general population to decrease and ultimately stop the burden of viral transmission and symptomatic infections.<sup>24</sup>

According to Yang and colleagues,<sup>24</sup>the groups that should be prioritized to receive the COVID-19 vaccine are essential workers, which include healthcare providers as a top priority (according to the Palestinian Central Bureau of Statistics, the number of healthcare providers in Palestine in 2019 was 45,379 workers, including nurses, MDs, dentists, and pharmacists); high-risk individuals who may

experience severe or fatal outcomes; and those who contribute to viral transmission, especially those who work to maintain daily activities such as transportation, food services, law enforcement, and civil services.

Furthermore, the health care system in Palestine remains submissive to Israel, with the Israeli state holding ultimate authority over healthcare budgets, border crossings, building permits, and pharmaceutical imports and exports. Consequently, MOH hospitals are basic compared to hospitals within Israel and lack many resources, especially specialist personnel, while the doctors practicing in the West Bank have limited opportunities for training and continued professional development due to imposed permit sanctions. Vaccine availability is therefore much lower in Palestine than in Israel. Building a plan to improve acceptance among those who are less willing to receive the vaccine will be crucial, as identified by the study results. Therefore, frontline healthcare providers should be aware of data regarding the safety of the vaccines and advise people to get the vaccine based on solid scientific evidence, as their recommendation and willing to receive the vaccine are known to be a driving factor that could positively affect the people's vaccination intentions. 25,26 Lessons learned from previous pandemics such as SARS and MERS suggest that trusted information and guidance from professionals are crucial to controlling the spread of disease.

Our study has shown that higher trust scores were linked to a greater interest in being vaccinated. According to the PMOH annual health report from 2018, 99.8% of children were given the diphtheriatetanus (DT), oral polio vaccine(OPV) vaccines in the first grade, and 99.5% of children got the dT vaccine in the ninth grade. <sup>10</sup>This shows that Palestinians appreciate and believe in the ability of vaccines to control diseases. In comparison, a cohort study conducted in the US found that more than 10% of parents reported delaying or refusing vaccinations for their children, also a study was conducted among parents in Turkey showed that they had low willingness rate to give their children the

COVID-19 vaccine.<sup>27,28</sup>Although UK and European populations showed positive attitudes toward vaccination, about 10% still showed distrust in or were unwilling to get vaccines.<sup>29</sup>

Trust in vaccines is strongly associated with compliance with vaccine uptake. Until the sufficient supply of COVID-19 vaccine is available, addressing vaccine hesitancy and building confidence among the population will be vital. This will require direct and clear communication from government officials to provide information about how the vaccine works and its development. Vaccination programs must address public concerns about the level of vaccine effectiveness and the time needed for protection. The promotion of vaccination programs should be adopted and encouraged by the leaders of municipalities, religious societies, and non-governmental organizations, as well as those in the private sector. Trust in the type of vaccine offered is very important. The scientific debate on which is the most effective vaccine with the least side effects might influence people's willingness to get the vaccine. The influence of the type of vaccine on people's acceptance was not studied in our study, but we are documenting a current observation of people avoiding a certain type of vaccine because of its side effects. Further research is needed to have a better understanding of people's choices and decisions.

We could not find any recent studies that investigated the "predictors of vaccine attitudes of Palestinians" and how such attitudes are associated with individuals who are not willing to receive the COVID-19 vaccine, except for one study by Salameh that investigated university students' knowledge of and attitude toward COVID-19 and only assessed if they would get the vaccine when it is available.<sup>31</sup>

The results of our study will help the government, policymakers, and healthcare professionals to effectively provide informative data during vaccination programs. However, further research is needed to investigate those who are uncertain or less willing to get the vaccine, since they are considered as a target group for interventions to increase confidence in vaccination.

Our study is the first to estimate the willingness of people to receive a COVID-19 vaccine in Palestine and reflects the positive attitude of Palestinians toward receiving the vaccine, so that it can be used as a guide for future vaccine uptake. Immunization with a safe and effective COVID-19 vaccine is an important strategy to reduce COVID-19-related morbidity and mortality and to help restore societal functioning. Although vaccines are currently in short supply, the ministry conveys to the population that the vaccine is on its way. Thus, it is important that the population get the vaccine.

Furthermore, to manage those who do not wish to be inoculated, public health authorities need to consider people's concerns about novel vaccines, such as "personal risk perception and vaccination attitude," and address these concerns through awareness campaigns that aim to educate the public about the vaccine's safety and how it will help mitigate public health risks.<sup>18</sup>

The higher the vaccine acceptance rate, the easier it will be for governments to quickly contain the spread of COVID-19 and better implement health management plans. It will be the responsibility of health agencies to build trust in the COVID-19 vaccine within communities.<sup>32</sup>

This study was the first one in Palestine to estimate the populations' acceptance, and so predicting the people's attitudes toward vaccination in order to help the policy makers to put the appropriate measures to face the pandemic. The study was also strengthened by having high participation rate at 1080 participants, especially when the people started to have study fatigue and boring due many studies conducting about COVID-19. However, our study might be subjective to certain limitation such as participation bias, since the people, who are interested in vaccine, are the ones to be responding to the survey.

#### **Funding**

None

**Conflict of interests** 

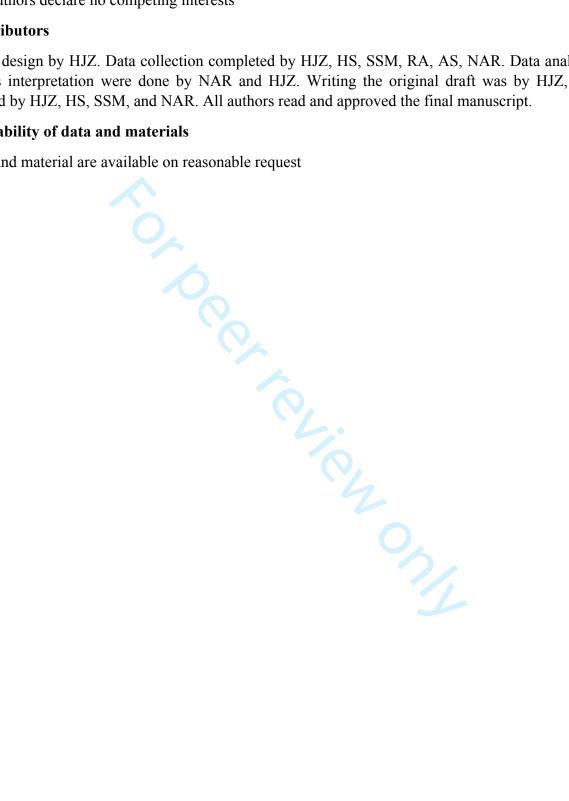
The authors declare no competing interests

#### **Contributors**

Study design by HJZ. Data collection completed by HJZ, HS, SSM, RA, AS, NAR. Data analysis and results interpretation were done by NAR and HJZ. Writing the original draft was by HJZ, HS and revised by HJZ, HS, SSM, and NAR. All authors read and approved the final manuscript.

#### Availability of data and materials

Data and material are available on reasonable request



#### **Ethics Statement**

This study obtained ethical approval from the Institutional Review Board at Bethlehem University.

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**Table 1 Participant Characteristics (n = 1080)** 

Characteristic	n (%)
Gender	
Female	633 (58.6)
Male	447 (41·4)
Age groups (years)	
18 – 24	368 (34·1)
25 – 34	311 (28·8)
35 – 44	228 (21·1)
> 45	173 (16·0)
Geographical region	, ,
Middle of West Bank	295 (27·3)
North of West Bank	147 (13.6)
South of West Bank	535 (46·8)
Gaza Strip	103 (9.5)
Locality	
City	645 (59·7)
Village	357 (33·1)
Camp	78 (7·2)
Marital Status	
Married	575 (53·2)
Not married	505 (46·8)
Educational level	114 (10.6)
Diploma or less	114 (10·6)
Bachelor Higher advection	713 (66·0)
Higher education	253 (23·4)
Employment status Health professionals	444 (41.1)
Non health professionals	444 (41·1) 636 (58·9)
Income	030 (38 9)
Excellent	84 (7·8)
Very good	325 (30·1)
Good	496 (45.9)
Less than good	99 (9.2)
Bad	43 (4.0)
Very bad	33 (3·1)
Smoking status	33 (3 1)
Cigarette only	158 (14·6)
Shisha only	140 (13.0)
Cigarette and shisha	29 (2.7)
Electronic cigarette	9 (0.8)
Ex-smoker	26 (2·4)

Never smoke	718 (66.5)
Having at least one underlying medical disease	
Yes	198 (18·3)
No	882 (81.7)
Personally reported with COVID-19	` ,
Yes	152 (14·1)
No	721 (66.9)
Do not know	204 (18.9)
Reported any family member (s) infected with COVID-	,
19	
Yes	1022 (94.9)
No	0(0.0)
Do not know	55 (5·1)
Had tested for COVID-19	, ,
Yes	440 (40.9)
No	637 (59·1)

Table2 Bivariate analysis correlates of getting a COVID-19 vaccine for participant characteristics

	Willingness to tak	te the vaccine (n = 88)	9)
Characteristic	Yes	No	P.value
	n (%)	n (%)	
Gender			
Female	296 (58·3)	212 (41·7)	< 0.001
Male	268 (70·3)	113 (29·7)	
Age groups (years)			
18 – 24	219 (73·5)	79 (26.5)	
25 - 34	161 (61·0)	103 (39·0)	< 0.001
35 - 44	106 (56·1)	83 (43.9)	
> 45	78 (56·5)	60 (43.5)	
Geographical region			
Middle of West Bank	139 (57·4)	103 (42.6)	
North of West Bank	83 (68.6)	38 (31·4)	< 0.001
South of West Bank	270 (61·2)	171 (38.8)	
Gaza Strip	72 (84·7)	13 (15·3)	
Urban/Rural Settings			
City	341 (64·8)	185 (35·2)	
Village	184 (62.0)	113 (38.0)	0.53
Camp	39 (59·1)	27 (40.9)	
Marital Status			
Married	280 (68·3)	193 (33.6)	0.005
Not married	284 (59·2)	132 (40.8)	
<b>Educational level</b>			
Diploma or less	56 (57·7)	41 (42·3)	
Bachelor	380 (65·3)	202 (34·7)	0.25

Higher education 128 (61.0) 82 (39.0) **Employment status** Health professionals 0.46247(64.8)134(35.2)Non health professionals 191 (37.6) 317(62.4)Income Excellent 45 (64.3) 25 (35.7) Very good 166 (63.6) 95 (36.4) 0.005Good  $272(66 \cdot 2)$ 139 (33.8) Less than good 36 (43.9) 46 (56·1) Bad 27(75.0)9(25.0)Very bad 18 (62·1) 11 (37.9) **Smoking status** Cigarette only 88(65.7)46 (34.3) Shisha only 87 (71.3) 35 (28.7) Cigarette and shisha 13 (61.9) 8(38.1)0.069 Electronic cigarette 6(100.0)0(0.0)Ex-smoker 17 (73.9) 6(26.1)Never smoke 353 (60.5) 230(39.5)Having at least one underlying medical disease Yes 0.7292 (62.2) 56 (37.8) No 472 (63.7) 269(36.3)Personally reported with COVID-19 Yes 82 (65.1) 44(34.9)No 381 (63.6) 218 (36.4) 0.82Do not know 101 (61.6) 63(38.8)Reported any family member (s) infected with COVID-19 Yes 540 (64.1) 303 (35.9) No 0.100(0.0)0(0.0)Do not know 24(47.8) $22(52\cdot 2)$ Had tested for COVID-19 Yes 242 (64.0) 136 (36.0) 0.76No 322(63.0)189(37.0)

Table 3 Attitude of study participant's toward getting a COVID-19 vaccine

Question	Willing to take the vaccine (n =		
	Yes n (%)	No n (%)	P. value
Would you agree to participate in clinical trials for testing efficacy of COVID-19 vaccine?			
Agree	211 (91·7)	19 (8.3)	
Disagree	291 (50·4)	286 (49.6)	< 0.001
Do not know	62 (75.6)	20 (24.4)	
Would you agree to pay to get the vaccine, if not provided	,	` ,	

freely?			
Agree	381 (94·1)	24 (5.9)	
Disagree	123 (30·4)	282 (69.6)	< 0.001
Do not know	60 (75.9)	19 (24·1)	
Would you get the vaccine from another country			
which either produces it, or has it; if not available in			
Palestine?			
Agree	234 (92·5)	19 (7.5)	
Disagree	181 (39·8)	274 (60·2)	< 0.001
Do not know	149 (82·3)	32 (17·7)	
Would you advise people to get the COVID-19 vaccine?			
Agree	468 (91.9)	41 (8·1)	
Disagree	16 (7.8)	189 (92·2)	< 0.001
Do not know	80 (54·3)	95 (45.7)	
Would you take the COVID-19, if has mild side effects?			
Agree	437 (90.9)	44 (9·1)	
Disagree	76 (22.8)	257 (77.2)	< 0.001
Do not know	51 (68.0)	24 (32.0)	
Score of attitude toward COVID-19 vaccine <sup>a</sup>		, , , , , , , , , , , , , , , , , , , ,	
(0)	21 (8·3)	232 (91·7)	
(1)	61 (44.5)	49 (55.5)	
(2)	104 (85·2)	18 (14.8)	< 0.001
(3)	157 (96·3)	6 (3.7)	
(4)	162 (95·3)	8 (4.7)	
(5)	71 (100.0)	0(0.0)	
Low score	21 (8·3)	232 (91·7)	
Moderate score	153 (65.9)	79 (34·1)	< 0.001
High score	157 (96·3)	6 (3.7)	

<sup>&</sup>lt;sup>a</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the 1<sup>st</sup> 1/3 of the answers), moderate score (represents the 2<sup>rd</sup> 1/3 of the answers), and high score (represents the 3<sup>rd</sup> 1/3 of the answers).

Table 4 Multivariate Logistic Regression of Willingness to get a COVID-19 Vaccine

Variable	Odds ratio	95% Confidence Interval	P.value
Gender			
Female	1.00		
Male	0.86	0.425 - 1.754	0.68
Age group (years)			
18-24	1.00		
25-34	0.22	0.079 - 0.594	0.003
35-44	0.12	0.031 - 0.468	0.002
>45	0.11	0.024 - 0.472	0.003
Geographical region			
Center of West Bank	1.00		

North of West Bank	1.47	0.439 - 4.909	0.53
South of West Bank	1.51	0.671 - 3.777	0.32
Gaza Strip	7.13	1.679 - 30.303	0.008
Locality			
City	1.00		
Village	1.02	0.484 - 2.161	0.95
Camp	2.36	0.701 - 7.945	0.17
Marital Status			
Not married	1.00		
Married	4.48	1.668 - 12.044	0.003
Educational level			
Diploma or less	1.00		
Bachelor	0.65	0.124 - 1.629	0.22
Higher education	0.85	0.162 - 2.636	0.55
<b>Employment status</b>			
Health professionals	1.00		
Non health professionals	0.85	0.412 - 1.767	0.67
Knowledge score towards nature of the virus			
Low	1.00		
Moderate	0.51	0.224 - 1.173	0.11
High	0.18	0.065 - 0.492	0.001
Knowledge score towards treatment and			
prevention			
Low	1.00		
Moderate	0.74	0.332 - 1.629	0.47
High	0.77	0.282 - 2.077	0.60
Knowledge Score towards priority groups			
Low	1.00		
Moderate	1.60	0.768 - 3.318	0.21
High	1.23	0.386 - 4.924	0.73
<b>Attitude Score towards vaccination</b>			
Low	1.00		
Moderate	13.91	$6 \cdot 042 - 32 \cdot 041$	< 0.001
High	110.62	$28 \cdot 329 - 431 \cdot 0$	< 0.001
Trust in vaccination score towards			
vaccination			
Low	1.00		
Moderate	2.90	$1 \cdot 109 - 7 \cdot 073$	0.029
High	11.80	$4 \cdot 092 - 34 \cdot 006$	< 0.001

Supplement Table1: Willing to be vaccinated by Knowledge of study population about the nature of COVID-19 virus

Question	Willing to take the vaccine (n = 889)			
	Yes n (%)	No n (%)	P. value	
What is COVID-19?				
Real virus	503 (69·1)	225 (30·1)		
Fabricated virus	54 (38.8)	85 (61·2)	< 0.001	
I Don't know what is COVID-19	7 (38.9)	11 (61·1)		
COVID-19 does not exist	0 (0.0)	4 (100.0)		
Do you think that you are susceptible to get the COVID-19 infection?				
Yes	542 (64.6)	297 (35.4)		
No	12 (47.8)	11 (52·2)	0.012	
Don't know	11 (40.7)	16 (59·3)		
Do you think washing hands for 20 seconds	,	,		
will limit the COVID-19 spread?				
Yes	499 (64.6)	274 (35·4)		
No	52 (55·3)	42 (44.7)	0.20	
Don't know	13 (59·1)	9 (40.9)		
Do you think wearing the mask correctly will aid to limit COVID-19 spread?				
Yes	533 (66·1)	273 (33.9)		
No	26 (38.8)	41 (61·2)	< 0.001	
Don't know	5 (31.3)	11 (68.7)		
Do you think keeping a safe distance of at least one meter from others will help to restrict COVID-19 spread?				
Yes	534 (64.9)	289 (35·1)		
No	23 (45·1)	28 (54.9)	0.007	
Don't know	7 (46.7)	8 (53·3)		
Do you think that following the health instructions compared with the possible COVID-19 vaccine will limit the spread of the corona infection?				
Yes	483 (62.6)	288 (37.4)	0.26	
No	54 (66.7)	27 (33·3)	0.36	
Don't know	27 (73.0)	10 (27.0)		
Score of knowledge about the nature of COVID-19 virus <sup>a</sup>				
(0)	0 (0.0)	4 (100.0)		
(1)	1 (16.7)	5 (83·3)		
(2)	11 (47.8)	12 (52·2)		
(3)	12 (42.9)	16 (57·1)		
(4)	32 (45.7)	38 (54·3)	< 0.001	
(5)	141 (62.9)	83 (37·1)		

(6)	367 (68.7)	167 (31·3)	
low knowledge score	135 (60·0)	90 (40.0)	_
Moderate knowledge score	298 (68·7)	136 (31·3)	0.05
High knowledge score	131 (57.0)	99 (43.0)	

<sup>a</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the  $1^{st}$  1/3 of the answers), moderate score (represents the  $2^{nd}$  1/3 of the answers), and high score (represents the  $3^{rd}$  1/3 of the answers).



Supplement Table2: Study population willingness to be vaccinated based on knowledge about prevention and treatment

Question	Willing to take the vaccine (n = 889)		
	Yes n (%)	No n (%)	P.value
Do you think antiviral medications will help in recovery from			
COVID-19 infection?	100 (62.0)	(2 (2 ( 0)	
Yes	108 (63·2)	63 (36.8)	0.22
No Don't know	232 (66.7)	116 (33·3)	0.23
Do you think anti-malarial medications will help in treating	224 (60·5)	146 (39·5)	
COVID-19 infection?			
Yes	43 (59.7)	29 (40·3)	
No	274 (66.8)	136 (33·2)	0.15
Don't know	247 (60.7)	160 (39.3)	
Do you think consumption of vitamins such as vitamin C will help in COVID-19 prevention?			
Yes	264 (56·7)	202 (43·3)	
No	212 (73·4)	77 (26.6)	< 0.001
Don't know	88 (65.7)	46 (34.3)	
Do you think using plasma from recovered COVID-19	, ,		
patients			
will help in treating COVID-19 infection?			
Yes	222 (66·3)	113 (33.7)	0.004
No Don't know	130 (68.4)	60 (31.6)	0.024
Do you think the future COVID-19 vaccine will be safe?	212 (58·2)	152 (41.8)	
Yes	220 (90.5)	23 (9.5)	
No	61 (27.7)	159 (72·3)	< 0.001
Don't know	283 (66.4)	143 (33.6)	\0 001
Do you think the future COVID-19 vaccine will cause side effects?	200 (00 1)	1.6 (66 6)	
Yes	261 (55·3)	211 (44.7)	
No	48 (78.7)	13 (21.3)	< 0.001
Don't know	255 (71.6)	101 (28.4)	
Do you think the future COVID-19 vaccine should be given annually?			
Yes	247 (74.4)	85 (25.6)	
No	137 (52.9)	122 (47·1)	< 0.001
Don't know	180 (60.4)	118 (39.6)	
Do you think the future COVID-19 vaccine should be given			
separately from other vaccines?			
Yes	366 (64.0)	206 (36.0)	0.05
No	54 (63.5)	31 (36.5)	0.88
Don't know	144 (62·1)	88 (37.9)	
Do you think the future COVID-19 vaccine will increase			

corona			
infection cases instead of providing immunity?			
Yes	44 (38·3)	71 (61.7)	
No	349 (79.0)	93 (21.0)	< 0.001
Don't know	171 (51.5)	161 (48.5)	
Score of knowledge about the COVID-19 prevention and treatment <sup>b</sup>			
(0)	27 (57.4)	20 (42.6)	
(1)	83 (64·3)	46 (35.7)	
(2)	112 (68·3)	52 (31.7)	
(3)	121 (58·2)	87 (41.8)	0.31
(4)	99 (65·1)	53 (34.9)	
(5)	66 (64.7)	36 (35·3)	
(6)	32 (62·7)	19 (37·3)	
(7)	11 (52·4)	10 (47.6)	
(8)	7 (77.8)	2 (22·2)	
(9)	6 (100.0)	0 (0.0)	
Low score	110 (62.5)	66 (37.5)	
Moderate score	233 (62.6)	139 (37.4)	0.85
High score	99 (65·1)	53 (34.9)	
1			

<sup>&</sup>lt;sup>b</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the 1<sup>st</sup> 1/3 of the answers), moderate score (represents the 2<sup>nd</sup> 1/3 of the answers), and high score (represents the 3<sup>rd</sup> 1/3 of the answers).

Supplement Table3: Willingness to be vaccinated based on study population knowledge on priority groups to get the vaccine

Question	Willing to	Willing to take the vaccine (n = 889)		
	Yes n (%)	No n (%)	P.value	
Do you think future COVID-19 should be given to newborn?	· ,	· , ,		
Yes	230 (83.0)	47 (17.0)		
No	195 (48.4)	208 (51.6)	< 0.001	
Don't know	139 (66.5)	70 (33.5)		
Do you think future COVID-19 should be given				
to children younger than 18 years?				
Yes	343 (81.7)	77 (18·3)		
No	119 (41.9)	165 (58·1)	< 0.001	
Don't know	102 (55·1)	83 (44.9)		
Do you think future COVID-19 should be given				
to pregnant women? Yes	257 (01.2)	50 (10.7)		
No	256 (81·3)	59 (18.7)	-0.001	
Don't know	121 (41.0)	174 (59.0)	<0.001	
	187 (67.0)	92 (33.0)		
Do you think future COVID-19 should be given to elderly people?				
Yes	498 (72.8)	186 (27·2)		
No	22 (23.9)	70 (76·1)	< 0.001	
Don't know	44 (38.9)	69 (61·1)	10 001	
Do you think future COVID-19 should be given	. (63.7)	ox (0 = -)		
to immunocompromised patients?				
Yes	415 (71.7)	164 (28·3)		
No	56 (39.4)	86 (60.6)	< 0.001	
Don't know	93 (55·4)	75 (44.6)		
Score of knowledge about priority groups to be va	accinated <sup>c</sup>			
(0)	33 (23.6)	107 (76.4)		
(1)	40 (44.0)	51 (56.0)		
(2)	121 (59.9)	81 (40·1)	< 0.001	
(3)	137 (78.3)	38 (21.7)		
(4)	116 (77·3)	34 (22.7)		
(5)	117 (89·3)	14 (10·7)		
Low knowledge score	73 (31.6)	158 (68·4)		
Moderate knowledge score	258 (68·4)	119 (31·4)	< 0.001	
High knowledge sore	116 (77·3)	34 (22.7)		

<sup>&</sup>lt;sup>c</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the  $1^{st}$  1/3 of the answers), moderate score (represents the  $2^{nd}$  1/3 of the answers), and high score (represents the  $3^{rd}$  1/3 of the answers).

### Supplement Table4: Attitude of study participant's toward getting a COVID-19 vaccine based on their trust of vaccination

Question	V	Willing to take the vaccine (n =889)		
	Yes n (%)	No n (%)	P. value	
Would you give the COVID-19 vaccine				
to your children				
if available?				
Agree	406 (94.2)	25 (5·8)		
Disagree	75 (21.9)	267 (78·1)	< 0.001	
Don't know	83 (71.6)	33 (28·4)		
Do you trust in scientists and researchers				
thoughts				
about future COVID-19 vaccine?				
Agree	475 (88.0)	65 (12.0)		
Disagree	30 (14.6)	175 (85·4)	<0.001	
Don't know	59 (41.0)	85 (59.0)		
Do you the period (6 to 12 months) in whi	ich the scientists t	trying to		
develop a COVID-19 vaccine is enough?				
Ye	261 (77.9)	74 (22·1)		
No	163 (54·3)	137 (45.7)	<0.001	
Don't know	140 (55·1)	114 (44.9)		
Do you think information about COVID-				
19 vaccine production				
is clear and should be open to public?	264 (72.0)	02 (25.1)		
Yes	264 (73.9)	93 (26·1)		
No	200 (52.9)	178 (47.1)	<0.001	
Don't know	100 (64.9)	54 (35·1)		
Score of attitude toward COVID-19 vacci				
(0)	18 (10·8)	149 (89·2)		
(1)	73 (38.8)	115 (61·2)		
(2)	189 (81.8)	42 (18·2)	< 0.001	
(3)	181 (91.0)	18 (9.0)		
(4)	103 (99.0)	1 (1.0)		
Low score	18 (10.8)	149 (89·2)		
Moderate score	73 (38.8)	115 (61·2)	< 0.001	
High score	189 (81.8)	42 (18·2)		
<sup>d</sup> The first option in each question above	is considered the	true answer (0) represe	nts no true answers	

<sup>&</sup>lt;sup>d</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the 1<sup>st</sup> 1/3 of the answers), moderate score (represents the 2<sup>nd</sup> 1/3 of the answers), and high score (represents the 3<sup>rd</sup> 1/3 of the answers).

#### **Questionnaire for:**

## A Study to evaluate the willingness and attitudes of population in Palestine towards future COVID-19 Vaccine

#### **English Form**

#### **Background:**

Corona virus infection is a current pandemic international infectious Disease. Palestine is one of the countries affected by the infection. There is no current treatment for corona virus according Centers for Disease Control and Prevention and World Health Organization. Scientists are working very hard to produce a vaccine, which will produce immunity against the virus. There is no approved vaccine has been produced so far, but few teams reach advanced steps towards producing the future vaccine. Regarding that, we need to know the population opinion in Palestine about the possible future covid-19 virus vaccine using the following questionnaire.

Your participation is voluntary, you do not have to answer any question you do not want to, and you can withdraw from the completing the study any time. Survey takes 7-10 minutes to go.

If you agree to participate in this study, please complete the survey, given that any personal information will be confidentially preserved. Your participation is appreciated.

This study approved by the IRB committee from Bethlehem University, Palestine.

The responsible researchers are:

- 1-Hassan J. Zawahrah: Jordan University of Science and Technology/Faculty of Medicine 2-Dr. Hanan Saca-Hazboun: Bethlehem University/ <sup>2</sup>Faculty of Nursing and Health Science 3-Dr.Shatha S. Melhem: Jordan University of Science and Technology/ Obstetrics and Gynecology

  Dep.
- 4-Dr.Rabee Adwan: Makassed Charitable Society Hospital/<sup>4</sup>Infectious Diseases Unit 5-Dr.Ali Sabateen: Augusta Victoria Hospital/ <sup>4</sup>Infectious Diseases Unit 6-Prof. Niveen M.E. Abu Rmeileh: Birzeit University/ Institute of Community and Public Health

If you have any question or comment about the study, please contact via email on the following address: <a href="https://hjzawahrah16@med.just.edu.jo">hjzawahrah16@med.just.edu.jo</a>

#### **Section One: Demographic questions**

# 1- Have you ever participated in this study? 1. Yes 2. No 2- What is your gender?

- 1. Female
- 2. Male

3-	What is your age?
4-	Where do you live?
	1. Jerusalem
	2. Bethlehem
	3. Hebron
	4. Abu Dis
	5. Ramallah
	6. Nablus
	7. Jenin
	8. Tulkarm
	9. Qalqilyah
	10. Salfit
	11. Tubas
	12. Gaza
	13. North Gaza
	14. Khan Yonis
	15. Der Elbalah
	16. Jericho
5-	Do you live in urban or rural areas?
	1. City
	2. Village
	3. Camp
6-	What is your marital status?
	1. Single
	2. Married
	3. Divorced
	4. Widow/widower
	5. Other
7-	What is your Educational level?
	1. Below Tawjihi
	2. Tawjihi
	3. Diploma degree
	4. Bachelor degree
	5. Master degree or higher
8-	What is your occupation?

- 1. Healthcare provider 2. Non-healthcare provider 3. Housewife 4. Student 5. Other 9- How do you evaluate your monthly income compared to people live around? 1. Excellent 2. Very good 3. Good 4. Less than good 5. Bad 6. Very bad 10- A question about smoking; are you: 1. Cigarette smoker only 2. Shisha smoker only 3. Cigarette and shisha smoker 4. Electronic cigarette smoker 5. Ex-smoker 6. Not smoker 11-Do you have a chronic disease?/ you can choose more than one answer: 1. Heart diseases 2. DM 3. Respiratory diseases 4. Hematological diseases 5. Kidney diseases 6. Liver disease 7. Neurological diseases 8. Immunological diseases 9. Rheumatologic diseases 10. Endocrine diseases
- 12. I do not have chronic diseases

  12- Do you take a medication regularly?
  - 1. Yes

11. Other

2. No

Section two: Questions related to people's knowledge and attitude about COVID-19 vaccine

13- D	o you believe that Corona is:
	. Real viral infection
2	. Just conspiracy
3	. Don't know what corona virus is
4	. There is no corona virus
14- H	ave you infected by corona virus?
1	. Yes
2	. No
3	. Don't know
15- D	o you have relatives infected by corona virus?
1	. Yes
2	. No
3	. Don't know
16- H	ave you had a test (nasopharyngeal swap) for corona infection?
1	. Yes
2	. No
3	. Don't know
17- D	o you think the information about corona vaccine is available and accessible for
	eople?
1	. Yes
2	. No
3	. Don't know
	o you think an international effort would be better to make the vaccine than a
	ngle team?
	. Yes
2	
3	·
	o you think it is necessary to have more than one vaccine to prevent the infection?
_	. Yes
2	
3	·
	o you think a vaccine against covid-19 virus can be produced?
1	. Yes
2	. No

3.	Don't know
21- Do	you think corona virus infection can be prevented?
1.	Yes
2.	No
3.	Don't know
	you think patient with corona virus will produce self immunity against the virus en recovered?
1.	Yes
2.	No
3.	Don't know
23- Do	you think the vaccine of corona virus should be free?
1.	Yes
2.	No
3.	Don't know
24- Do	you think you are at high risk to be infected with corona virus?
1.	Yes
2.	No
3.	Don't know
	you think our body will produce self immunity against corona without a ccine?
1.	Yes
2.	No
3.	Don't know
	you believe that a good hygiene and washing hands for 20 seconds would help to event the infection?
1.	Yes
2.	No
3.	Don't know
	you think that wearing a mask correctly would help to prevent the covid-19 ection?
1.	Yes
2.	No
3.	Don't know
	you think keeping a safe distance of at least one meter would help to prevent the OVID-19 infection?
1.	Yes
2.	No

	3.	Don'	t know										
29.	- Do	you	think	that	following	the	health	instructions	would	aid	to	prevent	the
	CO	OVID-	-19 infe	ection	?								
	1.	Yes											
	2.	No											
	3.	Don'	t know										

- 30-Do you think antiviral medication can prevent corona infection better than the vaccine?
  - 1. Yes
  - 2. No
  - 3. Don't know
- 31-Do you think Anti Malarial drugs would help to prevent the corona infection better than the vaccine?
  - 1. Yes
  - 2. No
  - 3. Don't know
- 32-Do you think taking vitamins such as vitamin C would help to prevent the corona infection better than the vaccine?
  - 1. Yes
  - 2. No
  - 3. Don't know
- 33-Do you think that plasma\* from recovered COVID-19 patients and which may have antibodies against the virus, would help to prevent the infection compared to a vaccine?
  - \*Plasma is the liquid component of the blood and contains different constituents and one of them is the antibodies.
  - 1. Yes
  - 2. No
  - 3. Don't know
- 34- Do you think flu vaccine can prevent the corona infection?
  - 1. Yes
  - 2. No
  - 3. Don't know
- 35- What is the best way to produce an effective immunity against the corona, by your opinion?
  - 1. Herd Immunity
  - 2. Vaccination
  - 3. Anti malarial drugs

- 4. Anti viral drugs
- 5. Plasma from recovered corona patients
- 6. Following the health instructions

### 36-Do you think the corona vaccine would be safe?

- 1. Yes
- 2. No
- 3. Don't know

### 37- Do you think the future vaccine against corona will produce side effects?

- 1. Yes
- 2. No
- 3. Don't know

### 38- If you know the possible future vaccine name, what is the most effective vaccine will be?

- 1. The Oxford University vaccine
- 2. The Russian vaccine
- 3. The Chinese vaccine (Sinovac)
- 4. The American vaccine (Moderna)
- 5. The Australian vaccine (BCG vaccine)
- 6. Other vaccine
- 7. Don't know, did not hear about them
- 8. More than one can be effective

## 39-Do you think that the period (months to one year) scientists and researchers used is enough to produce an effective vaccine, given that the Russian one is already produced?

- 1. Yes
- 2. No
- 3. Don't know

#### 40- Do you think corona vaccine should be given annually?

- 1. Yes
- 2. No
- 3. Don't know

### 41-Do you think corona vaccine should be given alone and not combined with other vaccines?

- 1. Yes
- 2. No
- 3. Don't know

	you believe corona vaccine can produce the covid-19 infection instead of protect
	inst it?
	Yes
	No
	Don't know
	you think taking a medication for long time (regualrly) will affect the efficiency he vaccine?
1.	Yes
2.	No
3.	Don't know
44- Do	you think the effect of vaccine will be less in smokers?
1.	Yes
2.	No
3.	Don't know
45- Do	you think corona vaccine will cause long term health issues?
1.	Yes
2.	No
3.	Don't know
46- Do	you think corona vaccine could be linked to cancer?
1.	Yes
2.	No
3.	Don't know
47- Do	you think corona vaccine could cause chronic health problems?
1.	Yes
2.	No
3.	Don't know
48- Do	you think corona vaccine should be given to newborn?
1.	Yes
2.	No
3.	Don't know
49- Do	you think vaccine should be given to children less than 18 years old?
1.	Yes
2.	No
3.	Don't know
50- Do	you think corona vaccine should be give to pregnant women?
1.	Yes
2.	No

3. 1- <b>D</b> o	Don't know  you think the vaccine should be introduced to elderly people?
1.	
2.	No
3.	Don't know
2- Do	you think the vaccine should be given to immunocompromised patients?
1.	Yes
2.	No
3.	Don't know
3- Do	you think corona patient should take the vaccine?
1.	Yes
2.	No
3.	Don't know
4- W	no do you think should get the vaccine if available in the first order?
1.	Elderly
2.	Pregnant women
3.	Immunocompromised patients
4.	Health care providers
5.	People with chronic diseases
6.	Healthy people
7.	Children
8.	Don't know
5- W	ould you accept to participate in vaccine testing trial, voluntary?
1.	Agree
2.	Disagree
3.	Don't know
6- W	ould you accept to take the vaccine against corona virus if available?
1.	Agree
2.	Disagree
3.	Don't know
7- If 1	he vaccine was not granted for free, would you pay 150 NIS to get the vaccine?
1.	Agree
2.	Disagree
3.	Don't know

which has it?

	1.	Agree
	2.	Disagree
	3.	Don't know
59-	Wi	ll you advise other people to take the vaccine?
	1.	Agree
	2.	Disagree
	3.	Don't know
60-	Do	you trust scientist and researchers thoughts about the corona vaccine?
	1.	Yes
	2.	No
	3.	Don't know
61-	If t	he vaccine produce mild side effects, do you still want to take it?
	1.	Agree
	2.	Disagree
	3.	Don't know
62-	W	ould you accept to introduce the vaccine to your children if available?
	1.	Agree
	2.	Disagree
	3.	Don't know
		you collect information about the corona vaccine? If yes, what is the mos
	1.	News
	2.	Social media
	3.	Scientific articles
	4.	Health care providers (e.g., MD's)
	5.	TV
	6.	Radio
	7.	Not interested
64-	W	ould you take the seasonal flu vaccine this year?
	1.	Yes
	2.	No
	3.	Don't know
65-	Dio	l you take the seasonal flu vaccine last year?
	1.	Yes
	2.	No
	3.	Don't know

66- Have you ever refused taking any type of vaccine previously?

- 1. Yes 2. No
- 3. Don't know

The survey items were developed based on information about the COVID-19 pandemic provided by the World Health Organization (WHO).

### Reference:

WHO. Behavioral considerations for acceptance and uptake of COVID-19 vaccines: WHO technical advisory group on behavioral insights and sciences for health. World Health Organization; 2020. https://apps.who.int/iris/handle/10665/337335

# دراسة علمية عن اعتقاد الناس في فلسطين وسلوكياتهم حول اللّقاح المحتمل ضد فيروس كورونا المستجد

هلا بك،

تعتبر عدوى فيروس كورونا المستجد (كوفيد-19) هي المسبب للوباء المنتشر عالميا على مدى واسع ، فلسطين وكباقي الدول ، تاثرت بالوباء حيث يقدر عدد الاصابات بالفيروس في فلسطين حسب احصائيات وزارة الصحة الفلسطينية (المرصد الخاص بالكوفيد-19) اكثر من 89550 اصابة مؤكدة، وتبعا لمنظمة الصحة العالمية (WHO) ومنظمة الCDC الامريكية ، لا يوجد أي علاج تام لفيروس كورونا المستجد حاليا، بالاضافة انه لا يوجد حاليا أي لقاح فعّال ضد هذا الفيروس، العلماء يعملون بجد حتى يتمكنوا من انتاج لقاح يساعد على منح أجسامنا مناعة ضد هذا الفيروس، الباحثون أصبحوا على بعد خطوات قريبة من انتاج لقاح ضد الفيروس، لذلك نود معرفة اعتقاد الناس في فلسطين وآراءهم اتجاه اللقاح المحتمل في المستقبل ضد فيروس كورونا المستجد من خلال هذا الاستبيان.

مشاركتك في هذا البحث طوعية، ليس عليك الاجابة على اي سؤال لا تود\ي الاجابة عليه، وتستطيع الانسحاب من هذه الدراسة في أي وقت. حيث تستغرق مدة استكمال الاستمارة مدة 7-10 دقائق فقط.

إذا وافقت على المشاركة، ندعوك للإجابة على أسئلة الاستمارة، حيث أن أي معلومات شخصية ان وجدت، سوف تكون سرية ولن يتم مشاركتها مع طرف آخر.

علما ان هذه الدراسة حاصلة على موافقة لجنة الابحاث العلمية (IRB) في جامعة بيت لحم.

الباحثون المسؤولون:

حسن زواهرة ، جامعة العلوم والتكنولوجيا الاردنية \ كلية الطب

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دربيع عدوان، مستشفى المقاصد

د على سباتين، مستشفى المطلع

د. نيفين ابو رميلة، جامعة بيرزيت \ معهد الصحة العامة والمجتمعية (ICPH)

اذا كان لديك اي استفسار حول الدراسة/ الرجاء التواصل من خلال البريد الالكتروني التالي:

<u>hjzawahrah16@med.just.edu.jo</u>

\* Required

1.	* هل شاركت في هذه الدراسة من قبل؟
	Mark only one oval.
	نعم
	Y

\* ما هو جنسك؟
 Mark only one oval.
 انثى
 نكى

* في أي محافظة تسكن؟	
Mark only one oval.	
القدس	
بيت لحم	
الخليل	
ابو دیس	
رام الله	
نابلس	
جنین	
طولكرم	
قلقیلیة	
سلفیت	
طوباس	
غزة (	
شمال غزة	
خانيوس (	
دير البلح	
أريحا (	
* أين تعيش حاليا؟	
Mark only one oval.	

6.	* ما هي حالتك الاجتماعية؟
	Mark only one oval.
	اعزب / عزباء
	متزوج \ة
	منفصل \ة
	ارمل \ة
	غير ذلك
7	
7.	* ما هو تحصيلك العلمي؟
	Mark only one oval.
	اقل من توجيهي
	توجيهي
	دبلوم 💮
	بكالوريوس
	ماجستیر او دکتوراة،،الخ
8.	* ما هي طبيعة عملك؟
	Mark only one oval.
	(مقدم رعاية صحية (طبيب، ممرض، اخصائي مختبرات طبية، طبيب اسنان، صيدلة،الخ
	(غير مقدم للرعاية الصحية (معلم، مهندس، محامي، عامل،الخ
	ربة منزل
	طالب
	لا اعمل

9.	* كيف تقيّيم دخلك الشهري مقارنة بالناس حولك؟
	Mark only one oval.
	ممتاز
	جيد جدا
	ختر
	اقل من جيد
	سيء
	سیء جدا
	سي ۶ جــا
10.	* سؤال خاص بالتدخين، هل انت ؟
	Mark only one oval.
	مدخن سجائر فقط
	مدخن ارجيلة فقط
	مدخن سجائر وارجيلة
	سيجارة الكترونية
	مدخن سابق
	غير مدخن
	<u> </u>
11.	*! هل تعاني حاليا من أمراض مزمنة؟ يمكنك الاشارة الى اكثر من خيار
	Check all that apply.
	(امراض القلب (مثل ضغط الدم وغيرها
	السكري
	(امراض الجهاز التنفسي (مثل الربو وغيرها
	(امراض الدم (امراض نزف الدم، لوكيميا (امراض اكلى (مثل الفشل الكلوي وغيرها
	امراض الكبد
	(امراض الجهاز العصبي (مثل باركنسون، الزهايمر، الصرع، وغيرها
	(امراض المناعة (نقص المناعة
	امراض الروماتيزم
	(امراض الغدد الصماء (مثل فرط اوكسل الغدة الدرقية
	لا اعاني من امراض مزمنة

12.	* هل تتناول أي أدوية بشكل مزمن؟	
	Mark only one oval.	
	نعم	
	Y	
13.	* ماذا تعتبر فيروس كورونا؟	
	Mark only one oval.	
	عدوى فيروسية حقيقة	
	(تعقد أنه فيروس مصطنع (مؤامرة	
	لا اعلم ما هو فيروس كورونا	
	لا وجود لفيروس كورونا	
14.	* هل أصبت بعدوى فيروس كورونا المستجد؟	
	Mark only one oval.	
	نعم	
	∑   Y	
	لا أعرف	
15.	* هل أصيب أحد من أقربائك بعدوى فيروس كورونا المستجد؟	
	Mark only one oval.	
	نعم	
	∀	
	لا اعرف	

16.	* هل قمت بعمل فحص خاص بعدوى فيروس كورونا المستجد (مسحة من الانف)؟
	Mark only one oval.
	نعم
	∑ Y
17.	هل تعتقد ان المعلومات المتوفرة حول تصنيع اللقاح المحتمل واضحة ويجب ان تكون في متناول الناس؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف
18.	* هل تعتقد انه من الافضل أن يكون تعاون عالمي لانتاج اللقاح، بدلا من أن تصنّعه دولة واحد؟
	Mark only one oval.
	نعم
	У
	لا اعرف
19.	* هل تعتقد انه من الضروري ان يتم انتاج اكثر من لقاح لمنع انتشار عدوى فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∑   Y
	لا اعرف

20.	* هل تعتقد انه من الممكن تصنيع لقاح فعال ضد فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
21.	* هل تعتقد انه من الممكن تجنب بالاصابة بفيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∑ ¥
	لا اعرف
22.	* هل تعتقد ان الشخص المصاب بفيروس كورونا سوف يكوّن لديه مناعة ذاتية ضد الفيروس في حال تعافيه؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف
23.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يكون متاحا بشكل مجاني؟
	Mark only one oval.
	نعم
	$\bigvee \mathcal{V}$
	لا اعرف

24.	* هل تعتقد انك معرض \ ة للاصابه بفيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∀
	لا اعرف
25.	* هل تعتقد ان اجسامنا قادرة على تصنيع مناعة ذاتية ضد فيروس كورونا المستجد دون الحاجة الى اللقاح؟
	Mark only one oval.
	نعم
	Y
	لا اعرف
26.	هل تعتقد ان تعقيم اليدين جيدا و غسلها لمدة 20 ثانية على الاقل سوف يساعد على الحد من انتشار العدوى بسبب * فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف
27.	هل تعتقد ان لبس الكمامة بشكل صحيح (حيث تشمل تغطية الفم والانف معا) سوف يساعد على الحد من انتشار
	* العدوى بسبب فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	Y
	لا اعرف

28.	هل تعتقد أن المحافظه على المسافه الامنه مع الاخرين ( واحد متر ع الاقل) سوف يساعد على الحد من انتشار * فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
29.	هل تعتقد ان اتباع التعليمات الصحية سوف يساعد على منع انتشار العدوى مقارنة باللقاح المحتمل ضد فيروس * كورونا المستجد؟
	Mark only one oval.
	نعم
30.	هل تعتقد ان الادوية المضادة للفير وسات مثل ريميدسيفير سوف تساعد على التعافي من المرض بسبب فيروس * كورونا مقارنة بالوقاية التي ممكن ان يوفر ها اللقاح المحتمل ضد فيروس كورونا؟
	Mark only one oval.
	نعم
31.	هل تعتقد ان الادوية المضادة للملاريا سوف تساعد على علاج الاصابة بفيروس كورونا المستجد مقارنة بالوقاية التي * ممكن ان يوفرها اللقاح المحتمل ضد فيروس كورونا المستجد؟
	Mark only one oval.
	نعم

32.	الله تعتقد ان تناول الفيتامينات المقويه متل فيتامين سي سوف توفر وفايه من عدوى فيروس كورونا المستجد مقارنه * بالوقاية التي ممكن ان يوفر ها اللقاح المحتمل ضد الفيروس؟
	Mark only one oval.
	نعم
	V Y
	لا اعرف ()
33.	هل تعتقد ان البلاز ما التي يتم الحصول عليها من المتعافين من الفيروس والتي تحتوي على اجسام مضادة ضد الفيروس سوف تساعد على علاج الاصابة بالفيروس، مقارنة بالوقاية التي ممكن ان يوفر ها اللقاح المتوقع انتاجه؟ حيث ان البلاز ما هي احدى مكونات الدم، وهي مادة شفافة مائلة للون الاصفر وتحتوي على مكونات عدة، منها المضادة
	Mark only one oval.
	نعم
	∑   Y
	لا اعرف
34.	* هل تعتقد ان لقاح الأنفاونزا الموسمية سوف يساعد على الحد من انتشار العدوى بفيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف

35.	* ماذا هي باعتقادك الطريقة المثلى للحصول على مناعة ضد فيروس كورونا المستجد؟
	Mark only one oval.
	اعة القطيع (تحقق مناعة القطيع عندما تتكون مناعةٌ ضد المرض لدى نسبة كبيرة من المجتمع، مما يجعل انتقال للمرض من شخص لأخر غير مرجح. ونتيجة لذلك، يُصبح المجتمع بأكمله محميًا – وليس فقط أولئك الذين لديهم مناعة
	لقاح فعال ضد الغيروس
	الادوية المضادة للملاريا
	الادوية المضادة للفاير وسات
	البلازما من المتعافين من الفيروس
	اتباع التعليمات الصحية
36.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد سوف يكون آمنا؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف
37.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد سوف يتسبب في أعراض جانبية في حال اخده؟
	Mark only one oval.
	نعم
	Y
	لا اعرف

38.	* إذا سمعت عن اللقاحات المحتمله التي يتم العمل على انتاجها، مَن مِن اللقاحات التاليه يمكن ان يكون الاكتر فعاليه؟
	Mark only one oval.
	لقاح جامعة أكسفورد \ بريطانيا
	اللقاح الروسي
	(اللقاح الصيني ( سينوفاك
	Moderna / لقاح شرکة (مودرنا)-امریکا
	(BCG اللقاح الاسترالي (لقاح مرض السل
	لقاح اخر
	لم اسمع بهذه اللقاحات
	أكثر من لقاح ممكن ان يكون فعال
39.	هل تعتقد ان الفترة التي يحاول فيها الباحثين والعلماء انتاج لقاح فعال ضد فيروس كورونا المستجد خلال عدة أشهراو * سنة كافية لذلك، علما ان اللقاح الروسي بات اول لقاح ينتج في العالم؟
	Mark only one oval.
	نعم
	Y
	لا اعرف
40.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يُؤخذ سنويا؟
	Mark only one oval.
	نعم
	∑      Y
	لا اعرف

41.	هل تعتقد أن اللفاح المحتمل صد فيروس خورونا المستجد يجب أنه يعظى متفردا وبسكل متفصل عن اللفاحات * الأخرى؟
	Mark only one oval.
	نعم
42.	الله الله الله الله المحتمل ضد فيروس كورونا المستجد سوف يتسبب بزيادة الاصابات بعدوى الكورونا، بدلا من العدوى؟
	Mark only one oval.
	نعم لا لا لا لا اعرف
43.	* هل تعتقد ان تناول الادوية المزمن لفترات طويلة سوف يؤثر على فعالية اللقاح المحتمل؟
	Mark only one oval.
	نعم لا لا لا لا لا اعرف لا اعرف لا اعرف لا اعرف لا اعرف
44.	* هل تعتقد ان فعالية اللقاح المحتمل ضد فيروس كورونا المستجد سوف تكون قليلة عند المدخنيين؟
	Mark only one oval.
	نعم
	لا ( ) لا ( ) اعرف ( )

45.	* هل تعتقد ان اللقاح المحتمل لفيروس كورونا المستجد سوف يسبب مشاكل عقلية؟
	Mark only one oval.
	نعم
46.	* هل تعتقد انه من الممكن ان يكون اللقاح المحتمل ضد فيروس كورونا المستجد له علاقة بالسرطان؟
	Mark only one oval.
	نعم
47.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد سوف يتسبب بمشاكل صحية مزمنة؟
	Mark only one oval.
	نعم
48.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يعطى للمواليد الجدد؟
	Mark only one oval.
	لا اعرف

49.	$^*$ هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يقدم للأطفال دون سن $_{ m I8}$ عاما $^*$
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف
50.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يُعطى للمرأة الحامل؟
	Mark only one oval.
	نعم
	لا (
51.	* هل تعتقد ان كبار السن يجب ان يأخذوا اللقاح المحتمل ضد فيروس كورونا المستجد؟
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52.	الله الله الله المحتمل ضد فيروس كورونا المستجد يجب ان يُعطى للمرضى الذين يعاونون من نقص المناعة؟
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53.	* هل تعتقد ان الشخص المصاب بفيروس كورونا يجب ان يأخذ اللقاح في حال توفره؟
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54.	* من هي باعتقادك الفئة الاكثر التي يجب ان تحصل او لا على اللقاح المحتمل ضد فيروس كورونا المستجد في
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	كبار السن         المرأة الحامل         مرضى نقص المناعة         مقدمي الرعاية الصحية         اصحاب الإمراض المزمنة         الإشخاص السليمين         الإطفال         لا اعرف
55.	هل توافق على المشاركة في تجارب فحص فعالية اللقاح ضد فيروس كورونا المستجد بشكل طوعي، إذا أتيحت لك * المشاركة؟
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56.	* في حال وُجد لقاح فعال ضد فيروس كورونا المستجد، هل توافق على اخذ هذا اللقاح؟
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57.	إذا لم يكن اللقاح مجانا، هل ستقوم بدفع مبلغ من المال للحصول عليه،حيث من المتوقع ان تكون كلفة الجرعة الواحدة
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58.	إذا لم يكن اللقاح متوفرا في فلسطين، هل ستقوم بطلبه من البلد المصنّع للقاح للحصول عليه اوطلبه من دولة تمتلكه؟
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59.	* هل ستقوم بنصح الناس لأخذ اللقاح المحتمل ضد فيروس كورونا المستجد؟
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60.	* هل تثق في آراء العلماء والباحثين حول اللقاح المحتمل ضد فيروس كورونا المستجد؟
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61.	* إذا كان اللقاح المحتمل يسبب بعض الاعر اض الجانبية الخفيفة، هل ستو افق على أخد اللقاح؟
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62.	* إذا كان لديك اطفال، هل ستوافق على اعطائهم اللقاح المحتمل ضد فيروس كورونا المستجد في حال توفره؟
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63.	هل تقوم بجمع معلومات للمعرفة عن اللقاح المحتمل ضد فيروس كورونا المستجد، إذا كانت اجابتك نعم، ما هو * مصدرك للحصول عليها؟
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	الاخبار والجرائد
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64.	* هل انت مستعد الخذ لقاح الانفلونز ا الموسمية هذه الموسم ؟
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66.	* هل رفضت التطعيم من نوع معين من اللقاحات في الماضي؟
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STROBE Statement—Checklist of items that should be included in reports of cross-sectional studies

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2-3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			•
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of	5
Setting		recruitment, exposure, follow-up, and data collection	
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of	5
r articipants	O	participants	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders,	
variables	,	and effect modifiers. Give diagnostic criteria, if applicable	
 Data	8*	For each variable of interest, give sources of data and details of methods of	5
sources/measurement	0	assessment (measurement). Describe comparability of assessment methods if	
sources/incasurement		there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	
Study size	10	Explain how the study size was arrived at	5
		<u> </u>	
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If	6
Statistical methods	12	applicable, describe which groupings were chosen and why  (a) Describe all statistical methods, including those used to control for	6
Statistical methods	12		0
		confounding  (b) Describe array with the results array in a public results are distanced in terms of interesting.	
		(b) Describe any methods used to examine subgroups and interactions	
		(c) Explain how missing data were addressed	
		(d) If applicable, describe analytical methods taking account of sampling	
		strategy	
		$(\underline{e})$ Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers	7
		potentially eligible, examined for eligibility, confirmed eligible, included in	
		the study, completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical,	
		social) and information on exposures and potential confounders	
		(b) Indicate number of participants with missing data for each variable of	
		interest	
Outcome data	15*	Report numbers of outcome events or summary measures	7-9
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted	
		estimates and their precision (eg, 95% confidence interval). Make clear	
		which confounders were adjusted for and why they were included	

		(b) Report category boundaries when continuous variables were categorized	
		(c) If relevant, consider translating estimates of relative risk into absolute risk	
		for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and	
		sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias	10
		or imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives,	9-14
		limitations, multiplicity of analyses, results from similar studies, and other	
		relevant evidence	
Generalisability	21	Discuss the generalisability (external validity) of the study results	
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study	14
		and, if applicable, for the original study on which the present article is based	

<sup>\*</sup>Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

### **BMJ Open**

### Acceptance of COVID-19 vaccines in Palestine: A crosssectional online study

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### Acceptance of COVID-19 vaccines in Palestine: A cross-sectional online study

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#### **Abstract**

**Introduction:** In Palestine (West Bank and Gaza), there have been more than 320,890 known cases of COVID-19, resulting in 3452 deaths. The detrimental effects of the virus can be seen in the nation's health, economy, and government operations, leading to radical uncertainty that is exacerbated by the absence of any definitive treatment or vaccines. The level of knowledge about and trust in treatment and vaccination varies worldwide. This study aims to assess the willingness of Palestinians to receive a COVID-19 vaccine and their knowledge about such vaccines.

**Methods**: An online survey of adults over 18 years old (n = 1080) was conducted in Palestine in October 2020. Using multivariate logistic regression, we identified correlates of participants' willingness to get a COVID-19 vaccine.

**Results:** We found that about 63% of participants were willing to get a COVID-19 vaccine. However, acceptance varied with the specific demographic variables that were investigated. Females, married participants, and those aged 18-24 years are more likely to take the vaccine. Further, participants with good knowledge about the vaccine and its side effects are more willing to get the vaccine.

Conclusion: The availability of a safe and effective COVID-19 vaccine in Palestine is crucial to decrease the burden of COVID-19 morbidity and mortality. In addition, to ensure a high vaccination rate, health awareness campaigns should target those who are not willing to get the vaccine, especially those who are more vulnerable and the elderly.

### Strengths and limitations

- This study is the first to estimate the willingness of people to receive a COVID-19 vaccine in Palestine
- This study has a good and high participation rate
- This study is a cross-sectional online survey, therefore it was subjective to participation bias

### Introduction

The novel coronavirus (COVID-19) was first detected in Wuhan in 2019, signaling the start of a severe global pandemic. Since then, COVID-19 has infected over 107,532,472 people and caused 2,354,212 deaths worldwide. As of April 2021, COVID-19 has infected 317,961Palestinians and caused 3406 deaths. This has resulted in serious consequences for world health and the global economy and forced governments to operate in a context of radical uncertainty, as there were previously no definitive treatments or vaccines. Consequently, many countries have acknowledged these tremendous problems and are cooperating to improve the situation. Vaccines for COVID-19 are an important health measure to help bring the pandemic under control, and several promising vaccines have already been approved and are considered safe and effective. Several countries have started the process of vaccinating their populations using Pfizer/BioNTech, Moderna, Sputnik V, Sinopharm, and Oxford-AstraZeneca vaccines. Since the virus poses a significant threat to public health, vaccination is an essential intervention; however, public perception toward the uptake of COVID-19 vaccines has not yet been determined.

Determann and colleagues found that disease and vaccination programs influence respondents' receptiveness to vaccines during a pandemic, which affects vaccine uptake. Previous studies have shown that the general population's intention to accept or decline a vaccine is influenced by their perception of personal risk, attitude toward vaccination, and ethnicity. Kourlaba and colleagues reported that the acceptance rate for vaccination was 57.7% in Greece, while a behavioral model developed by Schwarzinger and colleagues predicted that 29.4% (95% CI: 28.6–30.2) of the French population of working age would refuse the COVID-19 vaccine.

The medical services in Palestine are fragmented and are provided by the Palestinian Ministry of Health (PMOH), non-governmental health institutions, military medical services, United Nations Relief and Works Agency(UNRWA), and the private sector. The number of medical cadres registered in various medical associations in Palestine has reached 31,873, of which 24,432 (76.6%) are in the West Bank and 7441 (23.3%) are in the Gaza Strip. Thus, after one year of battling with COVID-19, the health care system in Palestine is facing a crisis due to the spread and increase in the infection rate of COVID-19. Hospitals, which are already operating beyond their capacity, are being overloaded by new cases of COVID-19. Health providers are being faced with extraordinary levels of demand, as hospital beds are now essentially filled by COVID-19 cases and the number of infections is increasing. To decrease the incidence of COVID-19, lower the demand for intensive care, and reverse the course of the COVID-19 epidemic, a large portion of the population must be vaccinated within a short period. In the absence of prophylaxis through a vaccine, the surge in cases will likely continue.

Saied and colleagues observed that acceleration in the rate of vaccine development compared to the past had aroused speculation about whether or not such vaccines are safe to use. <sup>12</sup> Furthermore, they noted that the side effects of the new COVID-19 vaccinations are still unknown. People on social media are providing misleading information about the new vaccines. Consequently, WHO has administered a serious warning that this epidemic could turn into an "infodemic". This refers to a phenomenon that occurs when people start spreading debunked news and false information based on anecdotal evidence. <sup>13</sup>Qattan and colleagues stated that people need to accept the vaccine to implement a vaccination program successfully; this requires that the government build more public trust in emergency-released vaccines. <sup>14</sup>

Effective control of the COVID-19 pandemic via widespread vaccination will require achieving sufficient herd immunity among the population; for COVID-19, this requires a vaccination rate of about 67%. However, due to growing uncertainty and confusion among the general population

regarding vaccines effectiveness and safety, it is unclear whether the availability of vaccines will be met with a high uptake. Information is currently lacking about people's acceptance of COVID-19 vaccines and the factors that may influence their acceptance. <sup>16</sup>Therefore; this study aims to assess the willingness of the general public to get a COVID-19 vaccine in Palestine (West Bank and Gaza). This information will be crucial for planning future campaigns to improve vaccine uptake among the Palestinian population.

#### Methods

We conducted a cross-sectional web-based study to assess the willingness of the Palestinian population to receive aCOVID-19 vaccine. Participation was limited to those who were 18 years or older and residing in Palestine. Data was gathered anonymously online through a self-administered questionnaire designed using Google Forms distributed on different venues on social media such as Facebook and WhatsApp platforms, universities and different unions websites. We anticipated a minimum sample of 384 responses using the 95% confidence interval for population, and we limited the study by two months, and accepted any response in this period. Participants (n =1080) were informed that participation was voluntary and confidential, can stop completing the survey at any time. This study obtained ethical approval from the Institutional Review Board at Bethlehem University.

### Data collection

The survey items were developed based on information about the COVID-19 pandemic provided by the World Health Organization (WHO) (Supplement file 1).<sup>17</sup>A pilot testing was conducted on 46 participants who were excluded later from the study. Furthermore, face-validity with three Palestinian experts in the field of epidemiology was used to ensure the integrity of the questionnaire. The survey questionnaire consisted of several sections: demographic information, health status, and knowledge

about the nature of the COVID-19 virus, treatment and prevention modalities. In addition, the survey collected information about priority groups that should be vaccinated and participants' willingness to be vaccinated.

Demographic data included questions about gender, age, geographical region, locality (city, village, or camp), marital status, educational level, employment status, income, smoking status, and disease status. We then assessed items that might affect participants' willingness to be vaccinated, their knowledge regarding treatment modalities and prevention of COVID-19 and if such knowledge affected their willingness to be vaccinated. We asked participants whether certain medications would be of benefit to treat or prevent COVID-19 infection. Furthermore, participants were asked about the role of plasma from recovered COVID-19 patients in treating the infection. We also asked whether the vaccine would be safe or not once it is available and whether the vaccine would provide immunity against COVID-19 instead of transmitting the infection.

We also assessed the participants' knowledge of which priority groups should be vaccinated, and acceptance of COVID-19 vaccination was assessed by asking them about their willingness to get the vaccine once it becomes available in Palestine. In addition, trust in the vaccination process was evaluated by asking them if they would accept having their children vaccinated and if they trusted the scientists involved in COVID-19 vaccine development.

Knowledge and attitude scores were calculated by adding up the number of correct answers (i.e., the first answer option) for each question. Each variable was given equal weight, and each score was recoded into three equal groups.

#### 2.3. Statistical analysis

Analysis of the data was completed using IBM SPSS version 26.0. Descriptive measures are presented as frequencies and percentages. Pearson's chi-square was used for the comparison of categorical 6

variables. Bivariate analysis was conducted to measure the correlation between participants' willingness to get a COVID-19 vaccine and other independent variables. Multivariate logistic regressions were also performed to identify the variables associated with vaccine acceptance among Palestinians. Results were considered significant when the p-value was less than 0.050. Confidence intervals (95% CI) and odds ratios (ORs) were also determined.

#### **Patient and Public Involvement**

No patients were involved in this study.

# Results Participant characteristics

Of the 1080 participants, half were young adults between the ages of 25 and 44 (49.9%) and more than half were female (58.6%). The majority of participants came from the south of West Bank (46.8%) and lived in the city (59.7%). Just over half of the participants were married (53.2%) and the vast majority had bachelor's degrees (66.0%). About 41.1% of the participants were healthcare workers. Sixty-six and a half percent of participants never smoked, and only 18.3% of participants had at least one medical disease. Less than half of the participants had been tested for COVID-19 (40.9%). Only 14.1% reported a personal history of COVID-19 infection, while 94.9% reported a history of COVID-19 infection among family members (Table1).

#### Insert Table 1 here

#### Willingness to get a COVID-19 vaccine

Around 63% of participants were willing to get a COVID-19 vaccine (Table2). Based on participants' knowledge about the nature of the COVID-19 virus, participants who were willing to be vaccinated were those who considered COVID-19to be a real virus (69%), compared to those who believed it was

fabricated (39%) and those who did not know what COVID-19 was (39%, p <0·001). Participants who thought they were susceptible toCOVID-19 infection were willing to take the vaccine (65%), compared to those who did not (48%). Participants those who did not know if they were susceptible (41%, p = 0.012), or if they thought that following safety measures (wearing a mask and keeping physical distance), compared to those who did not believe in such measures and those who did not know (face masks: 66%, 39%, 31%, p < 0.001; distancing: 65%, 45%, 47%, p = 0.007) (Supplement file Table1).

#### Insert Table2 here

The bivariate analysis measuring participants' willingness to be vaccinated against COVID-19 and their knowledge about the treatment and prevention of COVID-19 infection showed that those who were willing to get the vaccine were those who thought that it would be safe (91%), compared to those who did not think it would be safe (28%), and those who did not know (66%, p < 0.001). Participants were also more willing to get the vaccine if they thought that the vaccine would not cause side effects (79%), compared to those who thought that it would (55%), and those who did not know (72%, p < 0.001);if they thought that the vaccine should be given every year (74%), compared to those who thought it should not (53%), and those who did not know (60%, p < 0.001); and if they believed that the COVID-19 vaccine would not transmit the infection instead of providing immunity (79%), compared to those who believed that it would (38%), and those who did not know (52%, p < 0.001). Moreover, those who did not think that vitamins (such as vitamin C) and plasma from recovered COVID-19 patients would be of benefit for preventing infection were more willing to get the vaccine compared to those who answered "yes" or "do not know" (vitamins: 73%, 57%, 66%, p < 0.001; plasma: 68%, 66%, 58%, p =0.024). Participants' knowledge about the utility of antiviral or anti-malarial medications to treat the infection, and giving the vaccine separately from other vaccines, did not significantly affect their willingness to receive the vaccine (Supplement file Table2).

Participants were in favor of distributing vaccines to all age groups, as well as pregnant women and the immunocompromised (Supplement file Table3). Participants' attitudes toward getting a COVID-19 vaccine (Table 3) were also assessed based on their trust in vaccination. Participants who were willing to receive the vaccine were those who agreed to give their children the vaccine (94%, p < 0.001), trusted scientists and researchers (88%, p < 0.001), thought that the period in which the vaccine was developed was sufficient (80%, p < 0.001), and thought that information regarding vaccine development should be clear and accessible (74%, p < 0.001), compared with those who disagreed or did not know (Supplement file Table4).

#### Insert Table3 here

In the multivariate logistic regression (Table4), participants were more likely to be willing to receive a COVID-19vaccine if they were married (OR = 4.48, 95%CI: 1.668-12.044), living in a camp (OR = 2.36, 95%CI: 0.701-7.945), or living in Gaza (OR = 7.13, 95%CI: 1.679-30.303). Participants who had high positive attitude scores toward vaccination would be more likely to accept the vaccine (OR = 1.62, 95%CI: 28.329-431.0), along with those who had moderate knowledge scores regarding which priority groups should be vaccinated (OR = 1.60, 95%CI: 0.768-3.318), and those who had high trust scores for vaccination were also more willing to get the COVID-19 vaccine (OR = 11.80, 95%CI: 4.092-34.006).

Participants were less likely to be willing to get a COVID-19 vaccine if they were male (OR = 0.86, 95%CI: 0.425-1.754), ages 45 and older (OR = 0.11, 95%CI: 0.024-0.472), had a bachelor's degree (OR = 0.65, 95%CI: 0.124-1.629), or were non-healthcare professionals (OR = 0.85, 95%CI: 0.412-1.767), and participants who had a high knowledge score regarding the nature of the COVID-19 virus (OR = 0.18, 95%CI: 0.065-0.492) and who had a moderate score toward the treatment and prevention of COVID-19 infection (OR = 0.74, 95%CI: 0.332-1.629).

#### Insert Table4 here

#### Discussion

This study aimed to evaluate the acceptance of COVID-19 vaccines among Palestinians. Around 63% of the study population showed a positive attitude toward vaccination against COVID-19. Our results were consistent with similar studies exploring the willingness of the population to be inoculated with the COVID-19 vaccine in Saudi Arabia (64·7%), China (72·5%), and the USA (80%). <sup>18</sup>As vaccines become available, it will be necessary to monitor changes in people's willingness and how that will affect vaccine uptake, since people's intentions do not always reflect their actual behavior. <sup>16</sup>Having a better understanding of the factors influencing people's decisions to accept an emergency-released vaccine can help authorities to manage the pandemic better. <sup>19</sup>

Many studies have shown that willingness to receive a vaccine is linked to several factors, including the risk of being infected with the virus; the severity of the virus; the safety, efficacy, and adverse outcomes of the vaccine; a lack of knowledge about the nature of vaccine-preventable diseases; and misconceptions and misinformation related to the vaccine. 18,19

This study has highlighted several factors that may increase or decrease people's willingness to receive the vaccine. Perceived risk of becoming infected was a positive predictor of the intention to be vaccinated. 18,19 Our results were consistent with those of previous studies and showed that 65% of participants believed that they could be susceptible to COVID-19 infection.

Although wearing a mask correctly and keeping a safe social distance are crucial for reducing the spread of COVID-19, the Centers for Disease Control and Prevention has stated that these measures alone will not be sufficient to stop the spread of the virus. Thus, using COVID-19 vaccines combined with these measures will be vital for stopping the pandemic.<sup>20</sup>As reported in our study, participants who understood the importance of the measures mentioned above were more willing to get the vaccine.

Therefore, governments and health agencies should do more to try and increase public awareness of the effectiveness of these measures.

According to the CDC, none of the existing COVID-19 vaccines will cause people to become infected with COVID-19. Furthermore, they confirmed that all the vaccines had been carefully assessed through clinical trials. COVID-19 vaccines have also been shown to decrease the seriousness of infection even if a person does become infected.<sup>20</sup>This supports our finding where most participants shared the same belief regarding the safety and effectiveness of the vaccine. Some participants who were reluctant to get the vaccine were worried about the side effects of the novel vaccine and its impact on their overall health. However, most of our study participants believed that the vaccine would not cause any serious side effects.

WHO has stated that every human being anywhere in the world who could benefit from a safe and effective COVID-19 vaccine should quickly have access to one. <sup>21</sup>Some of Palestine's neighboring countries such as Jordan and Egypt have started their vaccination campaigns, <sup>22</sup>and Palestinians also have the right to have fair and equal access to necessary health care, including COVID-19 vaccines, to face the burden of the pandemic, especially that physical implications such as path of the wall that has taken through West Bank and long-lived siege in Gaza that resulted in isolation from health care and making the vulnerable people in the society inaccessible to health services. <sup>9</sup>However, according to a correspondence published in The Lancet, the UN has stated that the majority of Palestinians are unlikely to have access to the available vaccines in the near future. <sup>23</sup>

As of March 2021, the limited vaccines that were available to Palestinians were used to cover the first phase of vaccination according to the priorities suggested by a study conducted in China; this includes maintaining necessary services such as healthcare and national security. The second stage will then aim to reduce the number of severe cases, thereby decreasing the number of hospitalizations, admissions to intensive care units, and deaths. As a third stage, vaccination could be extended to the general

population to decrease and ultimately stop the burden of viral transmission and symptomatic infections.<sup>24</sup>

According to Yang and colleagues,<sup>24</sup>the groups that should be prioritized to receive the COVID-19 vaccine are essential workers, which include healthcare providers as a top priority (according to the Palestinian Central Bureau of Statistics, the number of healthcare providers in Palestine in 2019 was 45,379 workers, including nurses, MDs, dentists, and pharmacists); high-risk individuals who may experience severe or fatal outcomes; and those who contribute to viral transmission, especially those who work to maintain daily activities such as transportation, food services, law enforcement, and civil services.

Furthermore, the health care system in Palestine remains submissive to Israel, with the Israeli state holding ultimate authority over healthcare budgets, border crossings, building permits, and pharmaceutical imports and exports. Consequently, MOH hospitals are basic compared to hospitals within Israel and lack many resources, especially specialist personnel, while the doctors practicing in the West Bank have limited opportunities for training and continued professional development due to imposed permit sanctions. Vaccine availability is therefore much lower in Palestine than in Israel. Building a plan to improve acceptance among those who are less willing to receive the vaccine will be crucial, as identified by the study results. Therefore, frontline healthcare providers should be aware of data regarding the safety of the vaccines and advise people to get the vaccine based on solid scientific evidence, as their recommendation and willing to receive the vaccine are known to be a driving factor that could positively affect the people's vaccination intentions. 25,26 Lessons learned from previous pandemics such as SARS and MERS suggest that trusted information and guidance from professionals are crucial to controlling the spread of disease.

Our study has shown that higher trust scores were linked to a greater interest in being vaccinated.

According to the PMOH annual health report from 2018, 99.8% of children were given the diphtheria12

tetanus (DT), oral polio vaccine(OPV) vaccines in the first grade, and 99.5% of children got the dT vaccine in the ninth grade. <sup>10</sup>This shows that Palestinians appreciate and believe in the ability of vaccines to control diseases. In comparison, a cohort study conducted in the US found that more than 10% of parents reported delaying or refusing vaccinations for their children, also a study was conducted among parents in Turkey showed that they had low willingness rate to give their children the COVID-19 vaccine. <sup>27,28</sup>Although UK and European populations showed positive attitudes toward vaccination, about 10% still showed distrust in or were unwilling to get vaccines. <sup>29</sup>

Trust in vaccines is strongly associated with compliance with vaccine uptake. Until the sufficient supply of COVID-19 vaccine is available, addressing vaccine hesitancy and building confidence among the population will be vital. This will require direct and clear communication from government officials to provide information about how the vaccine works and its development. Vaccination programs must address public concerns about the level of vaccine effectiveness and the time needed for protection. The promotion of vaccination programs should be adopted and encouraged by the leaders of municipalities, religious societies, and non-governmental organizations, as well as those in the private sector. Trust in the type of vaccine offered is very important. The scientific debate on which is the most effective vaccine with the least side effects might influence people's willingness to get the vaccine. The influence of the type of vaccine on people's acceptance was not studied in our study, but we are documenting a current observation of people avoiding a certain type of vaccine because of its side effects. Further research is needed to have a better understanding of people's choices and decisions.

We could not find any recent studies that investigated the "predictors of vaccine attitudes of Palestinians" and how such attitudes are associated with individuals who are not willing to receive the COVID-19 vaccine, except for one study by Salameh that investigated university students' knowledge

of and attitude toward COVID-19 and only assessed if they would get the vaccine when it is available.<sup>31</sup>

The results of our study will help the government, policymakers, and healthcare professionals to effectively provide informative data during vaccination programs. However, further research is needed to investigate those who are uncertain or less willing to get the vaccine, since they are considered as a target group for interventions to increase confidence in vaccination.

Our study is the first to estimate the willingness of people to receive a COVID-19 vaccine in Palestine and reflects the positive attitude of Palestinians toward receiving the vaccine, so that it can be used as a guide for future vaccine uptake. Immunization with a safe and effective COVID-19 vaccine is an important strategy to reduce COVID-19-related morbidity and mortality and to help restore societal functioning. Although vaccines are currently in short supply, the ministry conveys to the population that the vaccine is on its way. Thus, it is important that the population get the vaccine.

Furthermore, to manage those who do not wish to be inoculated, public health authorities need to consider people's concerns about novel vaccines, such as "personal risk perception and vaccination attitude," and address these concerns through awareness campaigns that aim to educate the public about the vaccine's safety and how it will help mitigate public health risks. 18

The higher the vaccine acceptance rate, the easier it will be for governments to quickly contain the spread of COVID-19 and better implement health management plans. It will be the responsibility of health agencies to build trust in the COVID-19 vaccine within communities.<sup>32</sup>

This study was the first one in Palestine to estimate the populations' acceptance, and so predicting the people's attitudes toward vaccination in order to help the policy makers to put the appropriate measures to face the pandemic. The study was also strengthened by having high participation rate at 1080 participants, especially when the people started to have study fatigue and boring due many studies conducting about COVID-19. However, our study might be subjective to certain limitation such as participation bias, since the people, who are interested in vaccine, are the ones to be responding to the survey.

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None

#### **Conflict of interests**

The authors declare no competing interests

#### **Contributors**

Study design by HJZ. Data collection completed by HJZ, HS, SSM, RA, AS, NAR. Data analysis and results interpretation were done by NAR and HJZ. Writing the original draft was by HJZ, HS and revised by HJZ, HS, SSM, and NAR. All authors read and approved the final manuscript.

#### Availability of data and materials

Data and material are available on reasonable request

#### **Ethics Statement**

This study obtained ethical approval from the Institutional Review Board at Bethlehem University.

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**Table 1 Participant Characteristics (n = 1080)** 

Characteristic	n (%)
Gender	
Female	633 (58.6)
Male	447 (41·4)
Age groups (years)	
18 – 24	368 (34·1)
25 – 34	311 (28·8)
35 – 44	228 (21·1)
> 45	173 (16·0)
Geographical region	, ,
Middle of West Bank	295 (27·3)
North of West Bank	147 (13.6)
South of West Bank	535 (46·8)
Gaza Strip	103 (9.5)
Locality	
City	645 (59·7)
Village	357 (33·1)
Camp	78 (7·2)
Marital Status	
Married	575 (53·2)
Not married	505 (46·8)
Educational level	114 (10.6)
Diploma or less	114 (10·6)
Bachelor Higher advection	713 (66·0)
Higher education	253 (23·4)
Employment status Health professionals	444 (41.1)
Non health professionals	444 (41·1) 636 (58·9)
Income	030 (38 9)
Excellent	84 (7·8)
Very good	325 (30·1)
Good	496 (45.9)
Less than good	99 (9.2)
Bad	43 (4.0)
Very bad	33 (3·1)
Smoking status	33 (3 1)
Cigarette only	158 (14·6)
Shisha only	140 (13.0)
Cigarette and shisha	29 (2.7)
Electronic cigarette	9 (0.8)
Ex-smoker	26 (2·4)

Never smoke	718 (66.5)
Having at least one underlying medical disease	
Yes	198 (18·3)
No	882 (81.7)
Personally reported with COVID-19	` ,
Yes	152 (14·1)
No	721 (66.9)
Do not know	204 (18.9)
Reported any family member (s) infected with COVID-	,
19	
Yes	1022 (94.9)
No	0(0.0)
Do not know	55 (5·1)
Had tested for COVID-19	, ,
Yes	440 (40.9)
No	637 (59·1)

Table2 Bivariate analysis correlates of getting a COVID-19 vaccine for participant characteristics

	Willingness to take the vaccine $(n = 889)$					
Characteristic	Yes	No	P.value			
	n (%)	n (%)				
Gender						
Female	296 (58·3)	212 (41·7)	< 0.001			
Male	268 (70·3)	113 (29·7)				
Age groups (years)						
18 – 24	219 (73·5)	79 (26.5)				
25 - 34	161 (61.0)	103 (39·0)	< 0.001			
35 - 44	106 (56·1)	83 (43.9)				
> 45	78 (56·5)	60 (43.5)				
Geographical region						
Middle of West Bank	139 (57·4)	103 (42.6)				
North of West Bank	83 (68.6)	38 (31·4)	< 0.001			
South of West Bank	270 (61·2)	171 (38.8)				
Gaza Strip	72 (84·7)	13 (15·3)				
Urban/Rural Settings						
City	341 (64·8)	185 (35·2)				
Village	184 (62.0)	113 (38.0)	0.53			
Camp	39 (59·1)	27 (40.9)				
Marital Status						
Married	280 (68·3)	193 (33.6)	0.005			
Not married	284 (59·2)	132 (40.8)				
<b>Educational level</b>						
Diploma or less	56 (57·7)	41 (42·3)				
Bachelor	380 (65·3)	202 (34·7)	0.25			

Higher education 128 (61.0) 82 (39.0) **Employment status** Health professionals 0.46247(64.8)134(35.2)Non health professionals 191 (37.6) 317(62.4)Income Excellent 45 (64.3) 25 (35.7) Very good 166 (63.6) 95 (36.4) 0.005Good  $272(66 \cdot 2)$ 139 (33.8) Less than good 36 (43.9) 46 (56·1) Bad 27 (75.0) 9(25.0)Very bad 18 (62·1) 11 (37.9) **Smoking status** Cigarette only 88(65.7)46 (34.3) Shisha only 87 (71.3) 35 (28.7) Cigarette and shisha 13 (61.9) 8(38.1)0.069 Electronic cigarette 6(100.0)0(0.0)Ex-smoker 17 (73.9) 6(26.1)Never smoke 353 (60.5) 230(39.5)Having at least one underlying medical disease Yes 0.7292 (62.2) 56 (37.8) No 472 (63.7) 269(36.3)Personally reported with COVID-19 Yes 82 (65.1) 44(34.9)No 381 (63.6) 218 (36.4) 0.82Do not know 101 (61.6) 63 (38.8) Reported any family member (s) infected with COVID-19 Yes 540 (64.1) 303 (35.9) No 0.100(0.0)0(0.0)Do not know 24(47.8) $22(52\cdot 2)$ **Had tested for COVID-19** Yes 242 (64.0) 136 (36.0) 0.76No 322(63.0)189(37.0)

Table 3 Attitude of study participant's toward getting a COVID-19 vaccine

Question	Willing to	(n = 889)	
	Yes n (%)	No n (%)	P. value
Would you agree to participate in clinical trials for testing efficacy of COVID-19 vaccine?			
Agree	211 (91·7)	19 (8.3)	
Disagree	291 (50·4)	286 (49.6)	< 0.001
Do not know	62 (75.6)	20 (24.4)	
Would you agree to pay to get the vaccine, if not provided	,	` ,	

freely?			
Agree	381 (94·1)	24 (5.9)	
Disagree	123 (30·4)	282 (69.6)	< 0.001
Do not know	60 (75.9)	19 (24·1)	
Would you get the vaccine from another country			
which either produces it, or has it; if not available in			
Palestine?			
Agree	234 (92·5)	19 (7.5)	
Disagree	181 (39·8)	274 (60·2)	< 0.001
Do not know	149 (82·3)	32 (17·7)	
Would you advise people to get the COVID-19 vaccine?			
Agree	468 (91.9)	41 (8·1)	
Disagree	16 (7.8)	189 (92·2)	< 0.001
Do not know	80 (54·3)	95 (45.7)	
Would you take the COVID-19, if has mild side effects?			
Agree	437 (90.9)	44 (9·1)	
Disagree	76 (22.8)	257 (77.2)	< 0.001
Do not know	51 (68.0)	24 (32.0)	
Score of attitude toward COVID-19 vaccine <sup>a</sup>		, , , , , , , , , , , , , , , , , , , ,	
(0)	21 (8·3)	232 (91·7)	
(1)	61 (44.5)	49 (55.5)	
(2)	104 (85·2)	18 (14.8)	< 0.001
(3)	157 (96·3)	6 (3.7)	
(4)	162 (95·3)	8 (4.7)	
(5)	71 (100.0)	0(0.0)	
Low score	21 (8·3)	232 (91·7)	
Moderate score	153 (65.9)	79 (34·1)	< 0.001
High score	157 (96·3)	6 (3.7)	

<sup>&</sup>lt;sup>a</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the 1<sup>st</sup> 1/3 of the answers), moderate score (represents the 2<sup>rd</sup> 1/3 of the answers), and high score (represents the 3<sup>rd</sup> 1/3 of the answers).

Table 4 Multivariate Logistic Regression of Willingness to get a COVID-19 Vaccine

Variable	Odds ratio	95% Confidence Interval	P.value
Gender			
Female	1.00		
Male	0.86	0.425 - 1.754	0.68
Age group (years)			
18-24	1.00		
25-34	0.22	0.079 - 0.594	0.003
35-44	0.12	0.031 - 0.468	0.002
>45	0.11	0.024 - 0.472	0.003
Geographical region			
Center of West Bank	1.00		

North of West Bank	1.47	0.439 - 4.909	0.53
South of West Bank	1.51	0.671 - 3.777	0.32
Gaza Strip	7.13	1.679 - 30.303	0.008
Locality			
City	1.00		
Village	1.02	0.484 - 2.161	0.95
Camp	2.36	0.701 - 7.945	0.17
Marital Status			
Not married	1.00		
Married	4.48	1.668 - 12.044	0.003
Educational level			
Diploma or less	1.00		
Bachelor	0.65	0.124 - 1.629	0.22
Higher education	0.85	0.162 - 2.636	0.55
<b>Employment status</b>			
Health professionals	1.00		
Non health professionals	0.85	0.412 - 1.767	0.67
Knowledge score towards nature of the virus			
Low	1.00		
Moderate	0.51	0.224 - 1.173	0.11
High	0.18	0.065 - 0.492	0.001
Knowledge score towards treatment and			
prevention			
Low	1.00		
Moderate	0.74	0.332 - 1.629	0.47
High	0.77	0.282 - 2.077	0.60
Knowledge Score towards priority groups			
Low	1.00		
Moderate	1.60	0.768 - 3.318	0.21
High	1.23	0.386 - 4.924	0.73
<b>Attitude Score towards vaccination</b>			
Low	1.00		
Moderate	13.91	$6 \cdot 042 - 32 \cdot 041$	< 0.001
High	110.62	$28 \cdot 329 - 431 \cdot 0$	< 0.001
Trust in vaccination score towards			
vaccination			
Low	1.00		
Moderate	2.90	$1 \cdot 109 - 7 \cdot 073$	0.029
High	11.80	$4 \cdot 092 - 34 \cdot 006$	< 0.001

#### **Ouestionnaire for:**

#### A Study to evaluate the willingness and attitudes of population in Palestine towards future **COVID-19 Vaccine**

#### **English Form**

#### **Background:**

Corona virus infection is a current pandemic international infectious Disease. Palestine is one of the countries affected by the infection. There is no current treatment for corona virus according Centers for Disease Control and Prevention and World Health Organization. Scientists are working very hard to produce a vaccine, which will produce immunity against the virus. There is no approved vaccine has been produced so far, but few teams reach advanced steps towards producing the future vaccine. Regarding that, we need to know the population opinion in Palestine about the possible future covid-19 virus vaccine using the following questionnaire.

Your participation is voluntary, you do not have to answer any question you do not want to, and you can withdraw from the completing the study any time. Survey takes 7-10 minutes to go.

If you agree to participate in this study, please complete the survey, given that any personal information will be confidentially preserved. Your participation is appreciated.

This study approved by the IRB committee from Bethlehem University, Palestine.

The responsible researchers are:

- 1-Hassan J. Zawahrah: Jordan University of Science and Technology/Faculty of Medicine 2-Dr. Hanan Saca-Hazboun: Bethlehem University/ <sup>2</sup>Faculty of Nursing and Health Science 3-Dr.Shatha S. Melhem: Jordan University of Science and Technology/ Obstetrics and Gynecology Dep.
- Charitable Society Hospital/4Infectious Diseases 4-Dr.Rabee Adwan: Makassed Unit Hospital/ <sup>4</sup>Infectious Sabateen: Augusta Victoria Diseases Unit 5-Dr.Ali 6-Prof. Niveen M.E. Abu Rmeileh: Birzeit University/ Institute of Community and Public Health

If you have any question or comment about the study, please contact via email on the following address: hjzawahrah16@med.just.edu.jo

#### **Section One: Demographic questions**

### 1- Have you ever participated in this study? 1. Yes 2. No

#### 2- What is your gender?

1. Female 2. Male

3-	What is your age?
4-	Where do you live?
	1. Jerusalem
	2. Bethlehem
	3. Hebron
	4. Abu Dis
	5. Ramallah
	6. Nablus
	7. Jenin
	8. Tulkarm
	9. Qalqilyah
	10. Salfit
	11. Tubas
	12. Gaza
	13. North Gaza
	14. Khan Yonis
	15. Der Elbalah
	16. Jericho
5-	Do you live in urban or rural areas?
	1. City
	2. Village
	3. Camp
6-	What is your marital status?
	1. Single
	2. Married
	3. Divorced
	4. Widow/widower
	5. Other
7-	What is your Educational level?
	1. Below Tawjihi
	2. Tawjihi
	3. Diploma degree
	4. Bachelor degree
	5. Master degree or higher
8-	What is your occupation?

- 1. Healthcare provider
- 2. Non-healthcare provider
- 3. Housewife
- 4. Student
- 5. Other

#### 9- How do you evaluate your monthly income compared to people live around?

- 1. Excellent
- 2. Very good
- 3. Good
- 4. Less than good
- 5. Bad
- 6. Very bad

#### 10- A question about smoking; are you:

- 1. Cigarette smoker only
- 2. Shisha smoker only
- 3. Cigarette and shisha smoker
- 4. Electronic cigarette smoker
- 5. Ex-smoker
- 6. Not smoker

#### 11- Do you have a chronic disease?/ you can choose more than one answer:

- 1. Heart diseases
- 2. DM
- 3. Respiratory diseases
- 4. Hematological diseases
- 5. Kidney diseases
- 6. Liver disease
- 7. Neurological diseases
- 8. Immunological diseases
- 9. Rheumatologic diseases
- 10. Endocrine diseases
- 11. Other
- 12. I do not have chronic diseases

#### 12- Do you take a medication regularly?

- 1. Yes
- 2. No

Section two: Questions related to people's knowledge and attitude about COVID-19 vaccine

13- D	o you believe that Corona is:
1	. Real viral infection
2	2. Just conspiracy
3	3. Don't know what corona virus is
4	I. There is no corona virus
14- H	lave you infected by corona virus?
1	. Yes
2	2. No
3	3. Don't know
15- D	o you have relatives infected by corona virus?
1	. Yes
2	2. No
3	3. Don't know
16- H	ave you had a test (nasopharyngeal swap) for corona infection?
1	. Yes
2	2. No
3	3. Don't know
17- D	o you think the information about corona vaccine is available and accessible for
p	eople?
1	. Yes
	2. No
	3. Don't know
	o you think an international effort would be better to make the vaccine than a
	ngle team?
<u> </u>	. Yes
_	2. No
	3. Don't know
	o you think it is necessary to have more than one vaccine to prevent the infection?
_	. Yes
2	
	3. Don't know
	o you think a vaccine against covid-19 virus can be produced?
-	. Yes
2	2. No

3.	Don't know
21- Do	you think corona virus infection can be prevented?
1.	Yes
2.	No
3.	Don't know
	you think patient with corona virus will produce self immunity against the virus
	en recovered?
	Yes
-	No De 241
	Don't know
	you think the vaccine of corona virus should be free?
-	Yes
2.	No De 211
	Don't know
_	you think you are at high risk to be infected with corona virus?
1.	Yes
2.	No No
	Don't know
	you think our body will produce self immunity against corona without a cine?
1.	Yes
2.	No
3.	Don't know
	you believe that a good hygiene and washing hands for 20 seconds would help to
pre	vent the infection?
1.	Yes
2.	No
	Don't know
	you think that wearing a mask correctly would help to prevent the covid-19 ection?
1.	Yes
2.	No
-	Don't know
	you think keeping a safe distance of at least one meter would help to prevent the
	VID-19 infection?
1.	Yes
2.	No

	3.	Don'	t know										
29-	Do	you	think	that	following	the	health	instructions	would	aid	to	prevent	the
	CC	VID-	19 infe	ction	?								
	1.	Yes											
	2.	No											
	3.	Don'	t know										

- 30-Do you think antiviral medication can prevent corona infection better than the vaccine?
  - 1. Yes
  - 2. No
  - 3. Don't know
- 31-Do you think Anti Malarial drugs would help to prevent the corona infection better than the vaccine?
  - 1. Yes
  - 2. No
  - 3. Don't know
- 32-Do you think taking vitamins such as vitamin C would help to prevent the corona infection better than the vaccine?
  - 1. Yes
  - 2. No
  - 3. Don't know
- 33-Do you think that plasma\* from recovered COVID-19 patients and which may have antibodies against the virus, would help to prevent the infection compared to a vaccine?
  - \*Plasma is the liquid component of the blood and contains different constituents and one of them is the antibodies.
  - 1. Yes
  - 2. No
  - 3. Don't know
- 34- Do you think flu vaccine can prevent the corona infection?
  - 1. Yes
  - 2. No
  - 3. Don't know
- 35- What is the best way to produce an effective immunity against the corona, by your opinion?
  - 1. Herd Immunity
  - 2. Vaccination
  - 3. Anti malarial drugs

- 4. Anti viral drugs
- 5. Plasma from recovered corona patients
- 6. Following the health instructions

#### 36-Do you think the corona vaccine would be safe?

- 1. Yes
- 2. No
- 3. Don't know

#### 37-Do you think the future vaccine against corona will produce side effects?

- 1. Yes
- 2. No
- 3. Don't know

### 38- If you know the possible future vaccine name, what is the most effective vaccine will be?

- 1. The Oxford University vaccine
- 2. The Russian vaccine
- 3. The Chinese vaccine (Sinovac)
- 4. The American vaccine (Moderna)
- 5. The Australian vaccine (BCG vaccine)
- 6. Other vaccine
- 7. Don't know, did not hear about them
- 8. More than one can be effective

## 39-Do you think that the period (months to one year) scientists and researchers used is enough to produce an effective vaccine, given that the Russian one is already produced?

- 1. Yes
- 2. No
- 3. Don't know

#### 40- Do you think corona vaccine should be given annually?

- 1. Yes
- 2. No
- 3. Don't know

## 41-Do you think corona vaccine should be given alone and not combined with other vaccines?

- 1. Yes
- 2. No
- 3. Don't know

42 D	1 1'
_	ou believe corona vaccine can produce the covid-19 infection instead of protect nst it?
1.	Yes
2. ]	No
3.	Don't know
	ou think taking a medication for long time (regualrly) will affect the efficiency e vaccine?
1.	Yes
2. 1	No
3.	Don't know
44- Do y	ou think the effect of vaccine will be less in smokers?
1.	Yes
2. ]	No
3.	Don't know
45- Do y	ou think corona vaccine will cause long term health issues?
1.	Yes
2. ]	No
3. ]	Don't know
46- Do y	ou think corona vaccine could be linked to cancer?
1.	Yes
2. ]	No
3.	Don't know
47- Do y	ou think corona vaccine could cause chronic health problems?
1. Y	Yes
2. N	No
3. I	Oon't know
48- Do y	ou think corona vaccine should be given to newborn?
1.	Yes
2. ]	No
3.	Don't know
49- Do y	ou think vaccine should be given to children less than 18 years old?
1.	Yes
2.	No
3.	Don't know
50- Do y	ou think corona vaccine should be give to pregnant women?
1.	Yes
2. ]	No
·	

Г	2	Dan't language
<i>5</i> 1 1	3.	Don't know you think the vaccine should be introduced to elderly people?
31-1	1.	Yes
-	2.	No.
	<del></del> 3.	Don't know
52- I	Do	you think the vaccine should be given to immunocompromised patients?
	1.	Yes
	2.	No
	3.	Don't know
53-1	Do	you think corona patient should take the vaccine?
	1.	Yes
	2.	No
	3.	Don't know
54- V	Wh	o do you think should get the vaccine if available in the first order?
	1.	Elderly
	2.	Pregnant women
	3.	Immunocompromised patients
	4.	Health care providers
	5.	People with chronic diseases
	6.	Healthy people
	7.	Children
	8.	Don't know
55- V	Wo	uld you accept to participate in vaccine testing trial, voluntary?
	1.	Agree
	2.	Disagree
	3.	Don't know
56- V	Wo	uld you accept to take the vaccine against corona virus if available?
	1.	Agree
	2.	Disagree
	3.	Don't know
57- <u>1</u>	[f t]	he vaccine was not granted for free, would you pay 150 NIS to get the vaccine?
	1.	Agree
	2.	Disagree
	3.	Don't know
<del>58-</del> 1	[f t]	he vaccine is not available in Palestine, would you ask for it from other country

which has it?

	1.	Agree
	2.	Disagree
	3.	Don't know
59-	Wi	ll you advise other people to take the vaccine?
	1.	Agree
	2.	Disagree
	3.	Don't know
60-	Do	you trust scientist and researchers thoughts about the corona vaccine?
	1.	Yes
	2.	No
	3.	Don't know
61-	If t	he vaccine produce mild side effects, do you still want to take it?
	1.	Agree
	2.	Disagree
	3.	Don't know
62-	Wo	ould you accept to introduce the vaccine to your children if available?
	1.	Agree
	2.	Disagree
	3.	Don't know
63-		you collect information about the corona vaccine? If yes, what is the mos
	1.	News
	2.	Social media
	3.	Scientific articles
	4.	Health care providers (e.g., MD's)
	5.	TV
	6.	Radio
	7.	Not interested
64-	Wo	ould you take the seasonal flu vaccine this year?
	1.	Yes
	2.	No
	3.	Don't know
65-	Dic	d you take the seasonal flu vaccine last year?
	1.	Yes
	2.	No
	3.	Don't know

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

66- Have you ever refused taking any type of vaccine previously?

- 1. Yes
- 2. No
- 3. Don't know

The survey items were developed based on information about the COVID-19 pandemic provided by the World Health Organization (WHO).

#### Reference:

WHO. Behavioral considerations for acceptance and uptake of COVID-19 vaccines: WHO technical advisory group on behavioral insights and sciences for health. World Health Organization; 2020. https://apps.who.int/iris/handle/10665/337335

## دراسة علمية عن اعتقاد الناس في فلسطين وسلوكياتهم حول اللّقاح المحتمل ضد فيروس كورونا المستجد

هلا بك،

تعتبر عدوى فيروس كورونا المستجد (كوفيد-19) هي المسبب للوباء المنتشر عالميا على مدى واسع ، فلسطين وكباقي الدول ، تاثرت بالوباء حيث يقدر عدد الاصابات بالفيروس في فلسطين حسب احصائيات وزارة الصحة الفلسطينية (المرصد الخاص بالكوفيد-19) اكثر من 89550 اصابة مؤكدة، وتبعا لمنظمة الصحة العالمية (WHO) ومنظمة ال CDC الامريكية ، لا يوجد أي علاج تام لفيروس كورونا المستجد حاليا، بالاضافة انه لا يوجد حاليا أي لقاح فعال ضد هذا الفيروس، العلماء يعملون بجد حتى يتمكنوا من انتاج لقاح يساعد على منح أجسامنا مناعة ضد هذا الفيروس، الباحثون أصبحوا على بعد خطوات قريبة من انتاج لقاح ضد الفيروس، لذلك نود معرفة اعتقاد الناس في فلسطين وآراءهم اتجاه اللقاح المحتمل في المستقبل ضد فيروس كورونا المستجد من خلال هذا الاستبيان.

مشاركتك في هذا البحث طوعية، ليس عليك الاجابة على اي سؤال لا تود\ي الاجابة عليه، وتستطيع الانسحاب من هذه الدراسة في أي وقت. حيث تستغرق مدة استكمال الاستمارة مدة 7-10 دقائق فقط.

إذا وافقت على المشاركة، ندعوك للإجابة على أسئلة الاستمارة، حيث أن أي معلومات شخصية ان وجدت، سوف تكون سرية ولن يتم مشاركتها مع طرف آخر.

علما ان هذه الدراسة حاصلة على موافقة لجنة الابحاث العلمية (IRB) في جامعة بيت لحم.

الباحثون المسؤولون:

حسن زواهرة ، جامعة العلوم والتكنولوجيا الاردنية \ كلية الطب

د. حنان حزبون، جامعة بيت لحم كلية التمريض

د. شذى ملحم، جامعة العلوم والتكنولوجيا اقسم النسائية والتوليد

دربيع عدوان، مستشفى المقاصد

د علي سباتين، مستشفى المطلع

د. نيفين ابو رميلة، جامعة بيرزيت \ معهد الصحة العامة والمجتمعية (ICPH)

اذا كان لديك اي استفسار حول الدراسة/ الرجاء التواصل من خلال البريد الالكتروني التالي:

<u>hjzawahrah16@med.just.edu.jo</u>

\* Required

1.	* هل شاركت في هذه الدراسة من قبل؟
	Mark only one oval.
	نعم

\* ما هو جنسك؟
 Mark only one oval.

* في أي محافظة تسكن؟	
Mark only one oval.	
القدس	
بيت لحم	
الخليل	
ابو دیس	
رام الله	
نابلس	
جنين	
طولكرم	
قلقيلية	
سلفیت	
طوباس	
غزة	
شمال غزة	
خانيوس (	
رفح (	
دير البلح	
أريحا (	
* أين تعيش حاليا؟	
Mark only one oval.	

6.	* ما هي حالتك الاجتماعية؟
	Mark only one oval.
	اعزب / عزباء
	متزوج \ة
	منفصل \ة
	ارمل اة
	غير ذلك
7.	* ما هو تحصيلك العلمي؟
	Mark only one oval.
	اقل من توجيهي
	توجيهي 💮
	ديلوم
	بكالوريوس
	ماجستیر او دکتوراة،،الخ
8.	* ما هي طبيعة عملك؟
	Mark only one oval.
	(مقدم رعاية صحية (طبيب، ممرض، اخصائي مختبرات طبية، طبيب اسنان، صيدلة،الخ
	(غير مقدم للرعاية الصحية (معلم، مهندس، محامي، عامل،الخ
	ربة منزل
	طالب
	لا اعمل

9.	* كيف تقيّيم دخلك الشهري مقارنة بالناس حولك؟
	Mark only one oval.
	ممتاز
	جيد جدا
	ختر عنت
	اقل من جيد
	سىء
	سيء جدا
10.	* سؤال خاص بالتدخين، هل انت ؟
	Mark only one oval.
	مدخن سجائر فقط
	مدخن ارجيلة فقط
	مدخن سجائر وارجيلة
	سيجارة الكترونية
	مدخن سابق
	غیر مدخن
11.	*! هل تعاني حاليا من أمراض مزمنة؟ يمكنك الاشارة الى اكثر من خيار
	Check all that apply.
	(امراض القلب (مثل ضغط الدم وغيرها
	السكري
	(امراض الجهاز التنفسي (مثل الربو وغيرها
	(امراض الدم (امراض نزف الدم، لوكيميا
	(امراض اكلى (مثل الفشل الكلوي وغيرها المراض الكبد المراض الكبد
	(امراض الجهاز العصبي (مثل باركنسون، الزهايمر، الصرع، وغيرها
	(امراض المناعة (نقص المناعة ]
	امراض الروماتيزم
	(امراض الغدد الصماء (مثل فرط اوكسل الغدة الدرقية
	غير ذلك
	لا اعاني من امراض مزمنة

12.	* هل تتناول أي أدوية بشكل مزمن؟
	Mark only one oval.
	نعم ( ) لا
13.	* ماذا تعتبر فيروس كورونا؟
	Mark only one oval.
	عدوى فيروسية حقيقة
	(تعقتد أنه فيروس مصطنع (مؤامرة
	لا اعلم ما هو فيروس كورونا
	لا وجود لفيروس كورونا
14.	* هل أصبت بعدوى فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	Y (
	لا أعرف
15.	* هل أصيب أحد من أقربائك بعدوى فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	Y .
	لا اعرف

16.	* هل قمت بعمل فحص خاص بعدوى فيروس كورونا المستجد (مسحة من الانف)؟
	Mark only one oval.
17.	· هل تعتقد ان المعلومات المتوفرة حول تصنيع اللقاح المحتمل واضحة ويجب ان تكون في متناول الناس؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف
18.	* هل تعتقد انه من الافضل أن يكون تعاون عالمي لانتاج اللقاح، بدلا من أن تصنّعه دولة واحد؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف
19.	* هل تعتقد انه من الضروري ان يتم انتاج اكثر من لقاح لمنع انتشار عدوى فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف

20.	* هل تعتقد انه من الممكن تصنيع لقاح فعال ضد فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
21.	* هل تعتقد انه من الممكن تجنب بالاصابة بفيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∑   Y
	لا اعرف
22.	* هل تعتقد ان الشخص المصاب بفيروس كورونا سوف يكوّن لديه مناعة ذاتية ضد الفيروس في حال تعافيه؟
	Mark only one oval.
	نعم
	∑ ¥
	لا اعرف
23.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يكون متاحا بشكل مجاني؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف

24.	* هل تعتقد انك معرض \ ة للاصابه بفيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∀
	لا اعرف
25.	* هل تعتقد ان اجسامنا قادرة على تصنيع مناعة ذاتية ضد فيروس كورونا المستجد دون الحاجة الى اللقاح؟
	Mark only one oval.
	نعم
	∀
	لا اعرف
26.	هل تعتقد ان تعقيم اليدين جيدا و غسلها لمدة 20 ثانية على الاقل سوف يساعد على الحد من انتشار العدوى بسبب * فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	لا ( ) لا اعرف ( ) الا اعرف ( ) الا العرف ( ) العرف
	لا اعرف (
27.	هل تعتقد ان لبس الكمامة بشكل صحيح (حيث تشمل تغطية الفم والانف معا) سوف يساعد على الحد من انتشار
	* العدوى بسبب فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف

28.	هل تعلقد أن المحافظة على المسافة الامنة مع الاحرين ( واحد منز ع الاقل) سوف يساعد على الحد من النسار * فيروس كورونا المستجد؟
	Mark only one oval.
	نعم
29.	هل تعتقد ان اتباع التعليمات الصحية سوف يساعد على منع انتشار العدوى مقارنة باللقاح المحتمل ضد فيروس * كورونا المستجد؟
	Mark only one oval.
	لا اعرف
30.	هل تعتقد ان الادوية المضادة للفير وسات مثل ريميدسيفير سوف تساعد على التعافي من المرض بسبب فيروس * كورونا مقارنة بالوقاية التي ممكن ان يوفرها اللقاح المحتمل ضد فيروس كورونا؟
	Mark only one oval.
	لا اعرف
31.	الله في الله من الأدوية المضادة للملاريا سوف تساعد على علاج الاصابة بفيروس كورونا المستجد مقارنة بالوقاية التي * ممكن ان يوفرها اللقاح المحتمل ضد فيروس كورونا المستجد؟
	Mark only one oval.
	لا اعرف

32.	هل تعتقد ان تناول الفيتامينات المقوية مثل فيتامين سي سوف توفر وقاية من عدوى فيروس كورونا المستجد مقارنة * بالوقاية التي ممكن ان يوفر ها اللقاح المحتمل ضد الفيروس؟
	Mark only one oval.
	نعم
	لا ( اعرف
33.	هل تعتقد ان البلاز ما* التي يتم الحصول عليها من المتعافين من الفيروس والتي تحتوي على اجسام مضادة ضد الفيروس سوف تساعد على علاج الاصابة بالفيروس، مقارنة بالوقاية التي ممكن ان يوفر ها اللقاح المتوقع انتاجه؟ حيث ان البلازما هي احدى مكونات الدم، وهي مادة شفافة مائلة للون الاصفر وتحتوي على مكونات عدة، منها المضادة
	Mark only one oval.
	نعم
	لا ( )  لا اعرف ( )
34.	* هل تعتقد ان لقاح الأنفلونزا الموسمية سوف يساعد على الحد من انتشار العدوى بفيروس كورونا المستجد؟
	Mark only one oval.
	نعم
	لا ( ) لا ( ) اعرف ( )

35.	* ماذا هي باعتقادك الطريقة المثلى للحصول على مناعة ضد فيروس كورونا المستجد؟
	Mark only one oval.
	ناعة القطيع (تحقق مناعة القطيع عندما تتكون مناعةٌ ضد المرض لدى نسبة كبيرة من المجتمع، مما يجعل انتقال المرض لم المرض من شخص لآخر غير مرجح. ونتيجة لذلك، يُصبح المجتمع بأكمله محميًا – وليس فقط أولئك الذين لديهم مناعة
	لقاح فعال ضد الفيروس
	الادوية المضادة للملاريا
	الادوية المضادة للفاير وسات
	البلازما من المتعافين من الفيروس
	اتباع التعليمات الصحية
36.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد سوف يكون آمنا؟
	Mark only one oval.
	نعم
	Y
	لا اعرف
37.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد سوف يتسبب في أعراض جانبية في حال اخده؟
	Mark only one oval.
	نعم
	Y
	لا اعرف

38.	* إذا سمعت عن اللقاحات المحتملة التي يتم العمل على انتاجها، مَن مِن اللقاحات التالية يمكن ان يكون الاكتر فعالية؟
	Mark only one oval.
	لقاح جامعة أكسفورد \ بريطانيا
	اللقاح الروسي
	(اللقاح الصيني ( سينوفاك
	Moderna / لقاح شرکة (مودرنا)-امریکا
	(BCG اللقاح الاسترالي (لقاح مرض السل
	لقاح اخر
	لم اسمع بهذه اللقاحات
	أكثر من لقاح ممكن ان يكون فعال
39.	هل تعتقد ان الفترة التي يحاول فيها الباحثين والعلماء انتاج لقاح فعال ضد فيروس كورونا المستجد خلال عدة أشهر او * سنة كافية لذلك، علما ان اللقاح الروسي بات اول لقاح ينتج في العالم؟
	Mark only one oval.
	نعم
	Y
	لا اعرف
40.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يُؤخذ سنويا؟
	Mark only one oval.
	نعم
	Y
	لا اعرف

41.	هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب انه يُعطى منفردا وبشكل منفصل عن اللقاحات * الاخرى؟
	Mark only one oval.
	نعم
42.	الله الله الله الله المحتمل ضد فيروس كورونا المستجد سوف يتسبب بزيادة الاصابات بعدوى الكورونا، بدلا من العدوى؟
	Mark only one oval.
	نعم لا لا لا لا اعرف
43.	* هل تعتقد ان تناول الادوية المزمن لفترات طويلة سوف يؤثر على فعالية اللقاح المحتمل؟
	Mark only one oval.
	نعم
44.	* هل تعتقد ان فعالية اللقاح المحتمل ضد فيروس كورونا المستجد سوف تكون قليلة عند المدخنيين؟
	Mark only one oval.
	نعم لا لا لا لا لا اعرف لا اعرف لا اعرف لا اعرف لا اعرف

45.	* هل تعتقد أن اللقاح المحتمل لفيروس كورونا المستجد سوف يسبب مشاكل عقليه؟
	Mark only one oval.
	نعم
46.	* هل تعتقد انه من الممكن ان يكون اللقاح المحتمل ضد فيروس كورونا المستجد له علاقة بالسرطان؟
	Mark only one oval.
	نعم لا لا لا لا اعرف لا اعرف
47.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد سوف يتسبب بمشاكل صحية مزمنة؟
	Mark only one oval.
	نعم
48.	* هل تعتقد أن اللقاح المحتمل ضد فيروس كورونا المستجد يجب أن يعطى للمواليد الجدد؟
	Mark only one oval.
	لا اعرف

49.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يقدم للأطفال دون سن 18 عاما؟
	Mark only one oval.
	نعم
50.	* هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يُعطى للمرأة الحامل؟
	Mark only one oval.
	نعم لا لا لا لا لا اعرف
51.	* هل تعتقد ان كبار السن يجب ان يأخذوا اللقاح المحتمل ضد فيروس كورونا المستجد؟
	Mark only one oval.
	نعم لا لا لا اعرف
52.	هل تعتقد ان اللقاح المحتمل ضد فيروس كورونا المستجد يجب ان يُعطى للمرضى الذين يعاونون من نقص المناعة؟
	Mark only one oval.
	نعم

53.	* هل تعتقد ان الشخص المصاب بفيروس كورونا يجب ان يأخذ اللقاح في حال توفره؟
	Mark only one oval.
	نعم
54.	* من هي باعتقادك الفئة الاكثر التي يجب ان تحصل او لا على اللقاح المحتمل ضد فيروس كورونا المستجد في
	Mark only one oval.
	كبار السن         المرأة الحامل         مرضى نقص المناعة         مقدمي الرعاية الصحية         اصحاب الامراض المزمنة         الإشخاص السليمين         الإطفال         لا اعرف
55.	الله على المشاركة في تجارب فحص فعالية اللقاح ضد فيروس كورونا المستجد بشكل طوعي، إذا أتيحت لك * المشاركة؟
	Mark only one oval.         اوافق         لا اوافق         لا اعرف

56.	* في حال وُجد لقاح فعال ضد فيروس كورونا المستجد، هل توافق على اخذ هذا اللقاح؟
	Mark only one oval.
	او افق
	لا اعرف
57.	إذا لم يكن اللقاح مجانا، هل ستقوم بدفع مبلغ من المال للحصول عليه،حيث من المتوقع ان تكون كلفة الجرعة الواحدة *منه تقدر ب 150 شيكل؟
	Mark only one oval.
	او افق
	لا او افق
	لا اعرف
58.	إذا لم يكن اللقاح متوفرا في فلسطين، هل ستقوم بطلبه من البلد المصنّع للقاح للحصول عليه اوطلبه من دولة تمتلكه؟.
	Mark only one oval.
	او افق
	لا او افق
	لا اعرف
59.	* هل ستقوم بنصح الناس لأخذ اللقاح المحتمل ضد فيروس كورونا المستجد؟
	Mark only one oval.
	او افق
	لا او افق
	لا اعرف

60.	* هل تثق في آراء العلماء والباحثين حول اللقاح المحتمل ضد فيروس كورونا المستجد؟
	Mark only one oval.
	او افق
	لا او افق
	لا اعرف
61.	* إذا كان اللقاح المحتمل يسبب بعض الاعراض الجانبية الخفيفة، هل ستوافق على أخد اللقاح؟
	Mark only one oval.
	او افق
	لا او افق
	لا اعرف
62.	* إذا كان لديك اطفال، هل ستوافق على اعطائهم اللقاح المحتمل ضد فيروس كورونا المستجد في حال توفره؟
	Mark only one oval.
	او افق
	لا او افق
	لا اعرف
63.	هل تقوم بجمع معلومات للمعرفة عن اللقاح المحتمل ضد فيروس كورونا المستجد، إذا كانت اجابتك نعم، ما هو
	* مصدرك للحصول عليها؟
	Mark only one oval.
	الاخبار والجرائد
	وسائل التواصل الاجتماعي
	مقالات علمية
	(مقدمي الرعاية الصحية (مثل الاطباء
	التلفاز
	الراديو
	غير مهتم .7

64.	* هل انت مستعد لاخذ لقاح الانفلونز ا الموسمية هذه الموسم ؟
	Mark only one oval.
	نعم
	Y Y
	لا اعرف
65.	* هل اخذت اللقاح ضد الانلفلونز ا الموسمية في الموسم الماضي؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف
66.	* هل رفضت التطعيم من نوع معين من اللقاحات في الماضي؟
	Mark only one oval.
	نعم
	∑ Y
	لا اعرف

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Supplement Table1: Willing to be vaccinated by Knowledge of study population about the nature of COVID-19 virus

Question	Willing to take the vaccine (n = 889)		
	Yes n (%)	No n (%)	P. value
What is COVID-19?			
Real virus	503 (69·1)	225 (30·1)	
Fabricated virus	54 (38.8)	85 (61·2)	< 0.001
I Don't know what is COVID-19	7 (38.9)	11 (61·1)	
COVID-19 does not exist	0 (0.0)	4 (100.0)	
Do you think that you are susceptible			
to get the COVID-19 infection?	7.10 (5.1.5)	207 (27 1)	
Yes	542 (64.6)	297 (35·4)	0.010
No D. W.I.	12 (47.8)	11 (52·2)	0.012
Don't know	11 (40·7)	16 (59·3)	
Do you think washing hands for 20 seconds will limit the COVID-19 spread?			
Yes	499 (64.6)	274 (35·4)	
No	52 (55·3)	42 (44.7)	0.20
Don't know	13 (59·1)	9 (40.9)	
Do you think wearing the mask correctly will aid to limit COVID-19 spread?	,	` '	
Yes	533 (66·1)	273 (33.9)	
No	26 (38.8)	41 (61·2)	< 0.001
Don't know	5 (31.3)	11 (68.7)	
Do you think keeping a safe distance of at least one meter from others will help to restrict COVID-19 spread?			
Yes	534 (64.9)	289 (35·1)	
No	23 (45·1)	28 (54.9)	0.007
Don't know	7 (46.7)	8 (53·3)	
Do you think that following the health instructions compared with the possible COVID-19 vaccine will limit the spread of the corona infection?			
Yes	483 (62.6)	288 (37.4)	
No	54 (66.7)	27 (33·3)	0.36
Don't know	27 (73.0)	10 (27.0)	
Score of knowledge about the nature of COVID-19 virus <sup>a</sup>		. ,	
(0)	0 (0.0)	4 (100.0)	
(1)	1 (16·7)	5 (83·3)	
(2)	11 (47.8)	12 (52·2)	
(3)	12 (42.9)	16 (57·1)	
(4)	32 (45.7)	38 (54·3)	< 0.001
(5)	141 (62.9)	83 (37·1)	

(6)	367 (68·7)	167 (31.3)	
low knowledge score	135 (60·0)	90 (40.0)	_
Moderate knowledge score	298 (68·7)	136 (31·3)	0.05
High knowledge score	131 (57.0)	99 (43.0)	

<sup>a</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the  $1^{st}$  1/3 of the answers), moderate score (represents the  $2^{nd}$  1/3 of the answers), and high score (represents the  $3^{rd}$  1/3 of the answers).



Supplement Table2: Study population willingness to be vaccinated based on knowledge about prevention and treatment

Question	Willing to take the vaccine (n = 889)		
<u>-</u>	Yes n (%)	No n (%)	P.value
Do you think antiviral medications will help in recovery from			
COVID-19 infection?			
Yes	108 (63·2)	63 (36.8)	
No Daniel Control of the Control of	232 (66.7)	116 (33·3)	0.23
Don't know	224 (60·5)	146 (39.5)	
Do you think anti-malarial medications will help in treating COVID-19 infection?			
Yes	43 (59.7)	29 (40·3)	
No	274 (66.8)	136 (33·2)	0.15
Don't know	247 (60.7)	160 (39·3)	
Do you think consumption of vitamins such as vitamin C will			
help in COVID-19 prevention? Yes	264 (56·7)	202 (43·3)	
No	212 (73.4)	77 (26.6)	< 0.001
Don't know	88 (65.7)	46 (34·3)	<0 001
Do you think using plasma from recovered COVID-19	00 (03 7)	10 (31 3)	
patients will help in treating COVID-19 infection?			
Yes	222 (66·3)	113 (33.7)	
No	130 (68.4)	60 (31.6)	0.024
Don't know	212 (58·2)	152 (41.8)	0 02.
Do you think the future COVID-19 vaccine will be safe?	(= - /	- ( -,	
Yes	220 (90.5)	23 (9.5)	
No	61 (27.7)	159 (72.3)	< 0.001
Don't know	283 (66.4)	143 (33.6)	
Do you think the future COVID-19 vaccine will cause side effects?			
Yes	261 (55·3)	211 (44.7)	
No	48 (78.7)	13 (21.3)	< 0.001
Don't know	255 (71.6)	101 (28.4)	
Do you think the future COVID-19 vaccine should be given annually?			
Yes	247 (74.4)	85 (25.6)	
No	137 (52.9)	122 (47·1)	< 0.001
Don't know	180 (60.4)	118 (39.6)	
Do you think the future COVID-19 vaccine should be given			
separately from other vaccines?			
Yes	366 (64.0)	206 (36.0)	
No D. A.I.	54 (63.5)	31 (36.5)	0.88
Don't know	144 (62·1)	88 (37.9)	
Do you think the future COVID-19 vaccine will increase			

corona			
infection cases instead of providing immunity?			
Yes	44 (38·3)	71 (61.7)	
No	349 (79.0)	93 (21.0)	< 0.001
Don't know	171 (51.5)	161 (48.5)	
Score of knowledge about the COVID-19 prevention and			
treatment <sup>b</sup>			
(0)	27 (57.4)	20 (42.6)	
(1)	83 (64.3)	46 (35.7)	
(2)	112 (68·3)	52 (31.7)	
(3)	121 (58·2)	87 (41.8)	0.31
(4)	99 (65·1)	53 (34.9)	
(5)	66 (64.7)	36 (35·3)	
(6)	32 (62.7)	19 (37.3)	
(7)	11 (52·4)	10(47.6)	
(8)	7 (77.8)	2 (22·2)	
(9)	6 (100.0)	0(0.0)	
Low score	110 (62.5)	66 (37.5)	
Moderate score	233 (62.6)	139 (37.4)	0.85
High score	99 (65·1)	53 (34.9)	
have an analysis of the same and the same an			

<sup>b</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the 1<sup>st</sup> 1/3 of the answers), moderate score (represents the 2<sup>nd</sup> 1/3 of the answers), and high score (represents the 3<sup>rd</sup> 1/3 of the answers).

Supplement Table3: Willingness to be vaccinated based on study population knowledge on priority groups to get the vaccine

Question	Willing t	Willing to take the vaccine (n = 889)		
	Yes n (%)	No n (%)	P.value	
Do you think future COVID-19 should be give		(* - 7		
to newborn?				
Yes	230 (83.0)	47 (17.0)		
No	195 (48.4)	208 (51.6)	< 0.001	
Don't know	139 (66.5)	70 (33.5)		
Do you think future COVID-19 should be give	en			
to children younger than 18 years?				
Yes	343 (81.7)	77 (18·3)		
No	119 (41.9)	165 (58·1)	< 0.001	
Don't know	102 (55·1)	83 (44.9)		
Do you think future COVID-19 should be give	en			
to pregnant women?	256 (01.2)	50 (10 5)		
Yes	256 (81·3)	59 (18.7)	0.001	
No	121 (41.0)	174 (59.0)	<0.001	
Don't know	187 (67.0)	92 (33.0)		
Do you think future COVID-19 should be give	en			
to elderly people? Yes	400 (72.0)	196 (27.2)		
No	498 (72.8)	186 (27·2)	-0.001	
Don't know	22 (23.9)	70 (76·1)	<0.001	
	44 (38.9)	69 (61·1)		
Do you think future COVID-19 should be give to immunocompromised patients?	en			
Yes	415 (71.7)	164 (28·3)		
No	56 (39.4)	86 (60.6)	< 0.001	
Don't know	93 (55.4)	75 (44.6)	<b>\0 001</b>	
Score of knowledge about priority groups to l		73 (44.0)		
(0)	33 (23.6)	107 (76.4)		
(1)	40 (44.0)	51 (56.0)		
(2)	121 (59.9)	81 (40·1)	<0.001	
(3)	137 (78.3)	38 (21.7)	<b>\0 001</b>	
(4)	116 (77.3)	34 (22.7)		
(5)	117 (89.3)	14 (10.7)		
Low knowledge score	73 (31.6)	158 (68.4)		
Moderate knowledge score	258 (68.4)	119 (31.4)	<0.001	
High knowledge sore		·	<0.001	
Thigh knowledge sole	116 (77·3)	34 (22.7)		

<sup>&</sup>lt;sup>c</sup>The first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the  $1^{st}$  1/3 of the answers), moderate score (represents the  $2^{nd}$  1/3 of the answers), and high score (represents the  $3^{rd}$  1/3 of the answers).

## Supplement Table4: Attitude of study participant's toward getting a COVID-19 vaccine based on their trust of vaccination

Question	V	Villing to take the vaccine (	n =889)
	Yes n (%)	No n (%)	P. value
Would you give the COVID-19 vaccine			
to your children			
if available?			
Agree	406 (94.2)	25 (5·8)	
Disagree	75 (21.9)	267 (78·1)	< 0.001
Don't know	83 (71.6)	33 (28·4)	
Do you trust in scientists and researche	ers		
thoughts			
about future COVID-19 vaccine?			
Agree	475 (88.0)	65 (12.0)	
Disagree	30 (14.6)	175 (85·4)	< 0.001
Don't know	59 (41.0)	85 (59.0)	
Do you think the period (6 to 12 month	s) in which the scien	ntists trying to	
develop a COVID-19 vaccine is enough	?		
Ye	261 (77.9)	74 (22·1)	
No	163 (54·3)	137 (45.7)	< 0.001
Don't know	140 (55·1)	114 (44.9)	
Do you think information about COVI	D-		
19 vaccine production			
is clear and should be open to public?			
Yes	264 (73.9)	93 (26·1)	
No	200 (52.9)	178 (47·1)	< 0.001
Don't know	100 (64.9)	54 (35·1)	
Score of attitude toward COVID-19 va	ccine versus lack of	trust <sup>d</sup>	
(0)	18 (10.8)	149 (89.2)	
(1)	73 (38.8)	115 (61.2)	
(2)	189 (81.8)	42 (18·2)	<0.001
(3)	181 (91.0)	18 (9.0)	
(4)	103 (99.0)	1 (1.0)	
Low score	18 (10.8)	149 (89·2)	
Moderate score	73 (38.8)	115 (61·2)	<0.001
High score	189 (81.8)	42 (18·2)	<b>\0 001</b>

dThe first option in each question above is considered the true answer; (0) represents no true answers answered by the participants, (1) represents one true answer answered by the participant and so on. Low score (represents the  $1^{st}$  1/3 of the answers), moderate score (represents the  $2^{nd}$  1/3 of the answers), and high score (represents the  $3^{rd}$  1/3 of the answers).

STROBE Statement—Checklist of items that should be included in reports of cross-sectional studies

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2-3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of	5
Setting		recruitment, exposure, follow-up, and data collection	
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of	5
r articipants	O	participants	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders,	
variables	,	and effect modifiers. Give diagnostic criteria, if applicable	
 Data	8*	For each variable of interest, give sources of data and details of methods of	5
sources/measurement	0	assessment (measurement). Describe comparability of assessment methods if	
sources/incasurement		there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	
Study size	10	Explain how the study size was arrived at	5
		<u> </u>	
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If	6
Statistical methods	12	applicable, describe which groupings were chosen and why  (a) Describe all statistical methods, including those used to control for	6
Statistical methods	12		0
		confounding  (b) Describe array with the results array in a public results are distanced in terms of interesting.	
		(b) Describe any methods used to examine subgroups and interactions	
		(c) Explain how missing data were addressed	
		(d) If applicable, describe analytical methods taking account of sampling	
		strategy	
		$(\underline{e})$ Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers	7
		potentially eligible, examined for eligibility, confirmed eligible, included in	
		the study, completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical,	
		social) and information on exposures and potential confounders	
		(b) Indicate number of participants with missing data for each variable of	
		interest	
Outcome data	15*	Report numbers of outcome events or summary measures	7-9
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted	
		estimates and their precision (eg, 95% confidence interval). Make clear	
		which confounders were adjusted for and why they were included	

		(b) Report category boundaries when continuous variables were categorized	
		(c) If relevant, consider translating estimates of relative risk into absolute risk	
		for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and	
		sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias	10
		or imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives,	9-14
		limitations, multiplicity of analyses, results from similar studies, and other	
		relevant evidence	
Generalisability	21	Discuss the generalisability (external validity) of the study results	
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study	14
		and, if applicable, for the original study on which the present article is based	

<sup>\*</sup>Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.